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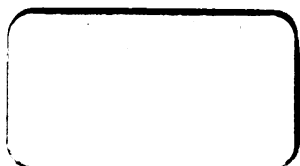
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Missouri
~~Mines~~
Labor

13TH ANNUAL REPORT

OF THE

★ STATE MINE INSPECTORS

OF THE

STATE OF MISSOURI. *Mine Inspector,*

FOR THE

YEAR ENDING JUNE 30, 1899.



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LETTER OF TRANSMITTAL.

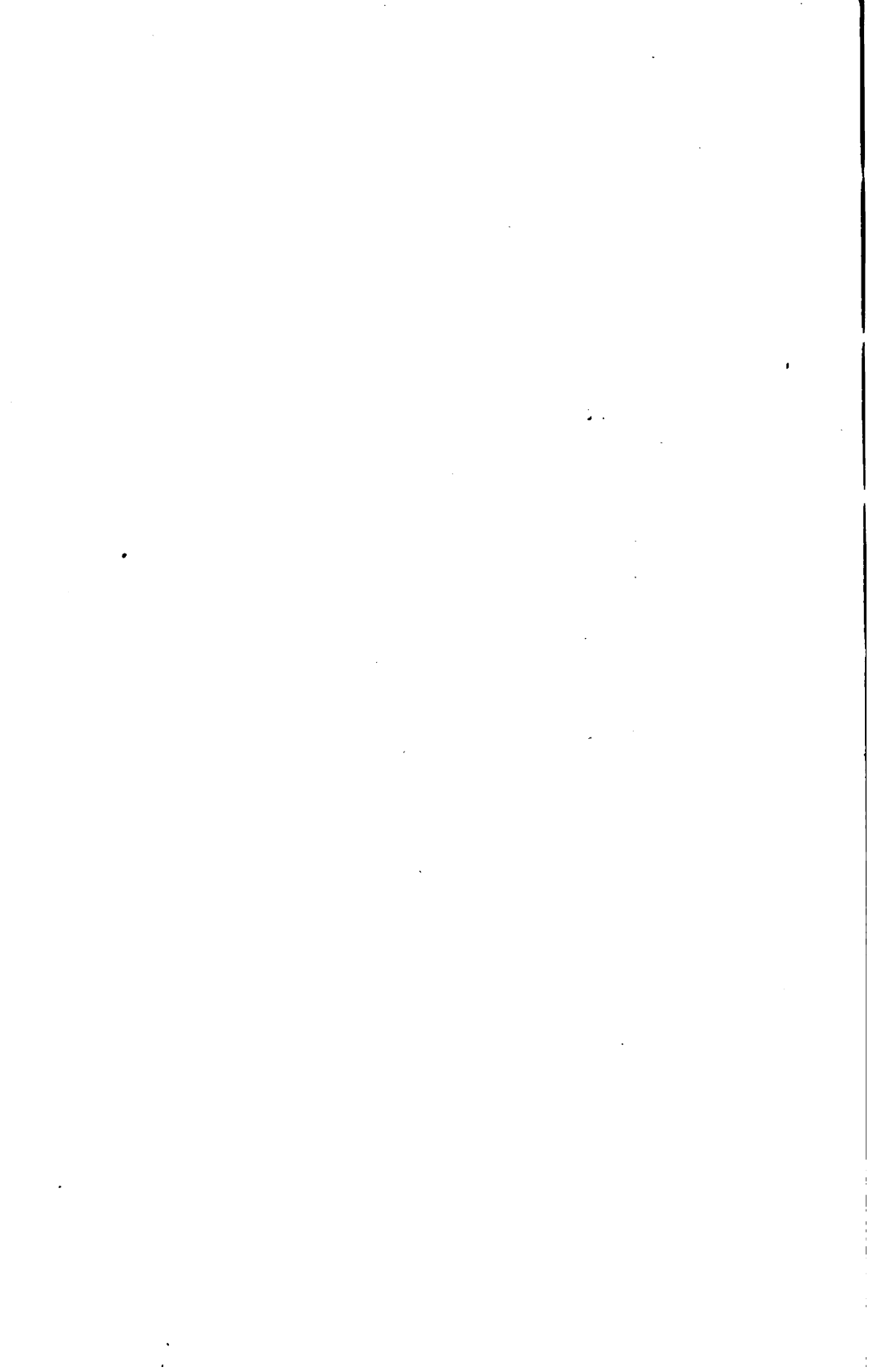
City of Jefferson, October 15, 1899.

HON. LON V. STEPHENS, Governor of Missouri:

SIR—In obedience to the requirement of law, I have the honor to submit the Thirteenth annual report of the Inspector of Coal Mines.

Very respectfully,

CHAS. EVANS,
Inspector of Coal Mines.



INTRODUCTION.

In presenting this, the 13th annual report on the coal mines of the State, for the fiscal year ending June 30, 1899, is with no small degree of pleasure that the statement can be truthfully made, that the results of the year have been the most satisfactory experienced by the present inspector. Not only has it proven the year of greatest production in the history of the State, but the good results arrived at through wise and salutary laws affecting the health and safety of the miners, and the excellent condition of the mines, have never before been excelled. During the past year the mines generally upon inspection were found to be in better condition from every point of view than in former years. The evidence of a willingness to acquiesce in and faithfully comply with the requirements of the mining laws have been specially noticeable. Where defects have been pointed out there was generally displayed a readiness to apply the remedies and follow the suggestions of the inspector unhesitatingly; in but one or two instances was a second visit made necessary by the inspector to secure the needed improvements.

The inspector highly appreciates the hearty co-operation of both the operators and miners, in securing the present very gratifying condition of our mines. To the miners especially is he under obligations for much valuable information relative to conditions existing in the respective mines. The field to be covered by the inspector is a very extensive one, and from the information gained through the miners many trips are avoided and a letter to an operator very often accomplishes all that could be done by a personal visit from the inspector.

In compiling this report the same course has been pursued that has heretofore influenced the inspector in former reports—that is, to avoid all superfluity, to make the matter as brief and concise as possible, and at the same time retain all important features necessary

for the information of its readers as well as to properly advertise the coal industry of the State. As in former years, the same diligence has been exercised with a view to the maintenance of that healthy, sanitary condition made necessary for the health and comfort of the miners, as well as to provide against accidents.

In the exercise of my authority the aim has been to promote the best interests of all concerned and in as mild and conciliatory way and manner as possible, require and secure a strict compliance with our mining laws.

This opportunity is taken advantage of to most sincerely thank operators and miners for kindnesses and courtesies shown me, and for the assistance so often rendered me in advancing to the best possible under-ground conditions to be found in the mines of any state.

The attention of statisticians and editors of mining journals is respectfully called to the following statement:

The mine inspectors, from the beginning of January, 1889, to the present, have been annoyed and perplexed by the reported output of coal in this state, for the years 1887 and 1888. With the knowledge that neither system nor practical mine experience played any part in arriving at the actual output of our mines; yet a delicacy in attacking the correctness of the figures given prevents us, for fear of being misunderstood. Impressed as we are with the feeling that in permitting the errors to be repeated year after year, that the coal output for 1888, was 3,909,967 tons, and the usual reference to it "but since that time the annual product has dropped more than a million tons below these figures," that we are by a further silence countenancing a falsification of statistics and an injustice to the state.

The truth is that since 1888, our mines have not only increased in number, capacity and trade, but the number of miners employed is greater by over a thousand; yet with all the most modern methods and appliances made use of in the operation and management of our mines, and the up-to-date facilities and arrangements for securing the most exact data from which to compile statistics, we have never since been able to reach the output in question by 800,000 tons.

After a careful and painstaking revision of the entire matter, with a better knowledge of the condition, capacity and output of the mines operated in 1888, than the author of the estimated report of that year, we give the following as the proper output of coal from the mines of this state for the past thirteen years:

OUTPUT OF COAL IN THE STATE OF MISSOURI FROM 1887, TO JUNE 30, 1899,
INCLUSIVE.

For the year 1887.....	1,832,731 tons.
" 1888.....	2,028,104 "
" 1889.....	2,223,477 "
" 1890.....	2,437,399 "
" 1891.....	2,650,018 "
" 1892.....	3,017,285 "
" 1893.....	3,190,442 "
" 1894.....	2,383,322 "
" 1895.....	2,228,061 "
" 1896.....	2,420,147 "
" 1897.....	2,429,388 "
" 1898.....	2,838,152 "
" 1899.....	3,191,811 "
Total.....	<u>32,870,357 tons.</u>
Average.....	2,528,488 "

REPORT.

For our fiscal year ending June 30, 1899, we have the pleasure to record it the year of greatest production in the history of the State. From present appearances however, it is our opinion that we shall have to make the same statement relative to the production of the current year, as the indications all point to an exceedingly busy year for our mines. In connection with the prospective demand for our coal, must be reckoned the output in addition, from many large coal mining plants in process of erection at what will be when opened up, very extensive mines in several of our coal producing counties.

The current year is so promising that we shall be disappointed if our output is not increased 800,000 tons, and the 4,000,000 ton mark reached; this is based upon the hope that we will have no prolonged strikes.

The output of our mines for the year amounted to 3,191,811 tons, a gain over the preceding year of 353,659 tons, or 12.81 per cent. The average price received at the mines for the product was a fraction over \$1.12 per ton, an increase of one and twenty-six hundredths of a cent per ton over the former year.

The total receipts from the sale of the output was \$3,582,110; a gain of \$433,248, or 13.34 per cent over the year before.

While this is a good showing, yet it is disappointing with the knowledge that our output could and would have been 250,000 tons greater but for a most unfortunate strike which occurred some five or six weeks just prior to the close of our fiscal year. All strikes are unfortunate, but this one in particular, for the reason that our miners generally, were well employed with no grievance or trouble existing between them and the operators. This was what is known as a sympathy strike, and brought about in sympathy with the striking miners of the Indian Territory; a further description of which may be noticed in our article on strikes.

Coal was mined during the year in 36 counties, with 369 mines operated, of which there were 154 shaft openings, 65 slopes, 90 drifts, and 60 strip-pits. There were 11 new mines opened and 6 abandoned. Of the 369 mines 114 employed over 10 men and 255 a less number.

The mines gave employment during the winter to 7,195 miners, and 1,611 day men, a total of 8,806; the employees during the summer consisted of 5,393 miners and 1,385 day men, a total of 6,778 men, or an average for the year of 7,792 employees.

The miners used in extracting the coal, 66,714 kegs of powder, which cost them \$133,436. Out of the 369 mines, 33 per cent. used powder, and mined 70 per cent of the total output and shows an average of 33.81 tons mined per keg of powder. An average of 440 mules were worked in the mines in hauling coal from the working places to the mouth of the mine.

There was a total of 37 accidents of which 14 were fatal and 23 were non-fatal, one life was lost for every 228,000 tons mined and 138,774 tons mined for each person injured. There was one fatality for every 557 miners employed.

Accidents resulted from the following causes: 25 from falls of roof and coal; 5 from injuries received by mine cars; 3 from premature blasts; 2 from windy shots; 1 from being caught by a descending cage, and 1 from falling down shaft.

There were 17 single and 20 married men injured; 4 of the fatally injured had an aggregate insurance of \$7,200.

Nearly 70 per cent of all the accidents were due to falls of roof and coal; this however, is the universal experience in coal mines. Carelessness largely accounts for this character of accident, and the inexperienced miner figures prominently among the victims. It is claimed that the proportion of preventable accidents resulting from carelessness or violations of the mining laws, ranges between 40 and 50 per cent of the total number of accidents in America and England.

TABLE I.

Year ending June 30.	1898.	1899.	Increase.	Decrease.
No. of coal producing counties (reporting).....	36	36	.....	.....
No. of mines operated, including strip-pits.....	377	369	.....	8
No. of mines in which ten or more men were employed.....	113	114	1	.....
No. of fans in use during the year.....	52	50	.....	2
No. of tons of coal mined during the year.....	2,838,152	3,191,811	353,659	.....
Total amount received for the output.....	\$3,148,862	\$3,552,111	\$403,249	.....
Average price per ton received at the mines.....	1 10	1 12	.02	.....
No. of men employed during the winter.....	8,545	8,806	261	.....
No. of men employed during the summer.....	6,237	6,778	541	.....
No. of miners employed during the winter.....	7,025	7,195	170	.....
No. of miners employed during the summer.....	4,994	5,363	369	.....
No. of other employees during the winter.....	1,520	1,611	91	.....
No. of other employees during the summer.....	1,243	1,385	142	.....
Total number of kegs of powder consumed.....	61,030	66,714	5,684	.....
Total cost of powder.....	117,386	133,436	16,050	.....
No. of men fatally injured.....	9	14	5	.....
No. of men non-fatally injured.....	27	23	.....	4
No. of wives made widows.....	7	5	.....	2
No. of children made fatherless.....	23	13	.....	10
No. of tons mined for each life lost.....	315,350	227,986	.....	87,364
No. of tons mined for each non-fatal accident.....	106,117	138,774	33,657	.....
No. of new mines opened.....	9	11	2	.....
No. of mines worked out or abandoned.....	6	6	.....	.....

TABLE II.

Table No. II is a record of new mines opened up and of the old mines worked out and abandoned during the past year.

No. of new mines.	Name of company opening new mine.	County.	Name of company abandoning mine.	No. of mines abandoned.
1.....	North Missouri Coal Co.....	Adair county.....	.....	.....
1.....	American Fuel Co.....	" .....	.....	.....
		Bates county.....	Rich Hill Coal & Mining Co.....	Mine No. 19..... 1
1.....	L. R. Williams.....	Linn county.....	.....	.....
1.....	Bernard Schaeffer.....	"	Bernard Schaeffer.....	..... 1
2.....	Kansas & Texas Coal Co.....	Macon county.....	Kansas & Texas Coal Co.....	Nos. 43 and 46..... 2
1.....	Clark Coal Co.....	Ralls county.....	.....	.....
2.....	Elliott Coal Co.....	Randolph county.....	.....	.....
2.....	Jones & Davis.....	" .....	.....	.....
		Ray county.....	Richmond & Camden Coal Co.....	Mine No. 3..... 1
		Vernon county.....	Rich Hill Coal & Mining Co.....	Mine No. 17..... 1
11.....	New mines opened up.		Total number abandoned mines.....	6

TABLE III.

Showing by counties the principal improvements made in coal mines during the year ending June 30, 1898.

County.	Coal company.	Improvements.
Adair.....	American Fuel Co.....	Head house over tippie, 20 dwelling houses for use of miners, blacksmith shop, stable and barn, 75 pit-cars, an 8-ton gasoline engine, 2,600 feet of track, 2 air shafts sunk.
".....	Watson Coal Co.....	Six dwelling houses built for use of miners.
".....	D. C. Scott.....	Air-shaft and new hoisting rope.
".....	North Missouri Coal Co.....	Drift opened, tram road built, tippie house erected, switch laid, 20 dwellings for use of miners, 25 pit-cars.
".....	Rombauer Coal Co.....	Escapement shaft sunk, fan removed and placed on top air-shaft, stairway in escape shaft, 25 pit-cars and 20 dwellings built.
".....	Spring Valley Coal Co.....	Drift opened, one-half mile tramway, 20 pit-cars, and six houses for miners built.
Audrain.....	Vandalia Coal Co.....	New fan.
".....	Albert Dietme.....	Scale and pump put in.
".....	Lowder & Peterson.....	Shaft retimbered, new boiler set.
".....	Standard Coal Co.....	Coal shed built.
Barton.....	G. F. Thomas.....	Coal platform erected.
".....	J. W. Bell.....	Drift opened.
".....	Richard Hines.....	Drift opened and coal sheds built.
".....	J. M. Divine.....	Drift opened.
".....	Jos. Shorts.....	Second air-shaft sunk.
Bates.....	Walnut Creek Coal Co.....	Slope opened and air shaft sunk.
".....	Henry Washburn.....	Air-shaft sunk.
".....	Robt. Pearson.....	Gasoline engine for pumping.
".....	Bruce & Rees.....	Fan to take place of furnace.
".....	J. W. Martin.....	Shaft sunk and pit-top erected.
Boone.....	Blackfoot Coal Co.....	New rope, two new cages and repairs on hoisting apparatus.
".....	S. D. Gordon.....	Air-shaft sunk.
Cass.....	Creighton Coal Co.....	Three-fourths of mile tramway, escape shaft sunk.
Chariton.....	J. W. Kennedy.....	Air shaft sunk.
Grundy.....	Grundy County Coal Co.....	Shed to stock coal, cages rebuilt, 30 pit cars repaired.
Henry.....	Daly Coal Co.....	Shaft sunk.
".....	Wm. Rees.....	Shaft sunk.
".....	Co-operative Coal Co.....	New pump and new track.
".....	R. Bowen & Son.....	Machinery in place of mules to haul coal in mines.
".....	C. H. Stockton.....	Escapement shaft sunk.
".....	W. T. Meranda.....	Slope opened.
".....	Wm. England.....	New mine to take place of old one.
".....	John Hurst.....	Shaft sunk and equipped.
Howard.....	R. S. Jackson.....	Drift opened, platform and tippie-house built.
Jackson.....	Brush Creek Coal Co.....	Two hoisting ropes, cages repaired.
Lafayette.....	Dover Coal Co.....	Ten dwellings for miners, mules take place of men in taking coal to bottom.
".....	Mayview Coal Co.....	Furnace rebuilt.
".....	Lexington Coal Co.....	Second escape shaft sunk, 10-foot fan erected, blacksmith shop and forty pit-cars built. (Glenn Oak mine)
".....	".....	At Graddy mine—electric engine and dynamo, new dumping device and fifty pit-cars.
".....	".....	At Sewell mine—six coal chutes erected.

Lafayette	Win. Schroeder	Air-shaft and new opening to mine.
"	Win. Parker	Mine opened.
"	Diamond Coal Co.	Shaft sunk and equipped, escape sunk, new ladders, 40 new pit-cars.
"	Thos. Walton	Pump put in.
"	J. Rossell	Two new hoisting ropes, 7 pit-cars.
"	J. C. McDrew	Blasting rock to make entries higher.
"	Bonanza Coal Co.	Fan substituted for furnace.
"	Farmer's Coal Co.	Wind-mill and smoke-stack erected.
"	Klondyke Coal Co.	Electric mining plant and steam instead of horse-power.
"	O. M. Gaffin	New drums and furnace.
Linn	Bernard Schaeffer	Mine opened, new tippie and railroad switch.
"	Mechanic Coal Co.	New shaft, machinery instead of horse-power, escape-shaft sunk, two new ropes, 25 pit-cars.
"	S. H. Williams	Two hoisting ropes.
"	Watson Coal Co.	Escapement shaft sunk.
Macon	James & Son	Second escape shaft sunk.
"	Peavler Black Diamond	Air shaft sunk.
"	Kansas & Texas Coal Co.	Escape shaft sunk and equipped, escape shaft sunk and stairway erected, 50 pit-cars built and one mile of track constructed.
Monroe	W. T. Green	Drift opened.
Montgomery	Thos. Green	Shaft sunk and equipped, furnace built and new scales provided.
Nodaway	Nichols & Hudson	Seven pit-cars.
Pettis	A. Carlson	Air-shaft sunk, head and boiler-house erected.
Punam	Rogers Bros.	Drift opened, 10 pit-cars, iron track laid.
"	Blackbird Coal Co.	Shaft retimbered, track and fan-house repaired.
Randolph	Elliott Coal Co.	Two new hoisting ropes at mine No. 3.
"	"	Shaker screen, track scale and 50 pit-cars.
"	Higbee Coal Co.	Two new hoisting ropes, entries retimbered, new overcast, and shaft curbing retimbered.
"	J. F. Robinson	Air-shaft sunk.
"	Jones and Davis	Two drift mines opened, 1,500 feet of track and trestle built, head-house and tippie erected, revolving screen.
"	John Cronan	Furnace built.
"	J. J. Lewis	Air-shaft sunk.
Balls	Clark Coal Co.	Holsting and air-shafts sunk and equipped, furnace and 10 cars built.
"	Balls County Coal Co.	25 new pit-cars—mules substituted for hand-power.
Ray	Mercantile Coal Co.	Furnace rebuilt and enlarged.
"	Williams Coal Co.	Recurring air-shaft.
"	Andrew Blair	New shaft to take place of old one.
"	Climax Coal Mine	Holsting apparatus repaired and new catches on cages.
"	Camden & Richmond Coal Co.	Fan at No's. 1 and 2 to take place of furnace.
"	Pence & Calnen	Machinery substituted for horse-power.
"	Kansas & Texas Coal Co.	New boiler and new cages.
"	P. Smith	Escape-shaft sunk.
"	L. L. Griggs	Slope mine opened.
St. Clair	John Klerfelm	Air-shaft sunk and gin built.
"	O. Mims	Drift mine opened—new scales.
"	Alex Oliver	Pit-top and dwelling for miners built.
"	W. A. Seymour	Shaft sunk.
Vernon	B. F. Auger	New pump.
"	Geo. Collett	New slope opening.

TABLE IV.

Summary of classified improvements at the mines for year ending June 30, 1889.

Boilers.....	2
Cables extended.....	
Cages.....	3
Catches on cages.....	2
Coal chutes.....	6
Cages repaired.....	4
Drums.....	1
Engines, new.....	4
Engines repaired.....	2
Boiler-houses, new.....	2
Entries enlarged.....	3
Fans erected.....	5
Furnaces built.....	6
Furnaces repaired and enlarged.....	3
Houses built for miners.....	83
Iron tracks substituted for wood.....	3
Overcasts put in.....	6
Machinery in place of hand-power.....	4
Pit-cars built and renewed.....	489
Pit-heads erected.....	6
Pumps.....	4
Ropes, holsting.....	15
Scales.....	4
Screens.....	3
Shafts, new.....	11
Shafts, air and escapement.....	26
Shafts retimbered.....	3
Side-tracks, feet.....	13,200
Stables.....	1
Stairways in escape-shafts.....	3
Steam-power.....	4
Tipple-houses.....	5
Tracks in mines, feet.....	24,940
Blacksmith shops.....	2
Smoke stack.....	1
Slope openings.....	4
Locomotive.....	1
Switches put in.....	2
Coal sheds.....	5
Windmill.....	1

、 VENTILATION OF COAL MINES.

The subject of mine ventilation is considered by the Coal Mine Inspector of this State one of the most important features connected with his official duties, and that every effort in his power should be exercised to secure steady improvement in the ventilation of our mines. Being of such vital importance one can not refrain from mentioning the subject as often as the opportunity affords, and making such suggestions for the betterment of the health and safety of the miners as far as his practical knowledge, experience and ability permits, even though the possible charge and criticism may be made that the subject is too often referred to. The fundamental facts upon which the chief principles of ventilation rests, though simple, are not so thoroughly known and understood as they should be by quite a number of those in charge of mines. In general terms the demands for ventilation presented at a mine are that the men must be supplied with as much fresh air as is required by each for respiration, and since a miner at hard work requires from two to three times as much air as when at rest, the supply must be proportionately increased. Then to the amount required simply for respiration purposes must be added the quantity requisite for maintaining the burning of clear lights. An additional amount is also required to sweep away the vitiation of the mine atmosphere, due to the respiration and exhalation of the men and mules, the burning of lights and the accessions of noxious gases from various sources, the return air of mines being so much vitiated in its passage through the excavations.

The ventilating pressure necessary for putting air in motion in the mine may be obtained by either a fan or a furnace, as both have the same effect in producing ventilation, that is to say, their operation results in altering the density of the air at one end of the column, thus destroying the equilibrium of pressure in the downcast and upcast shafts, and as long as the pressure is maintained by the means applied, the movement of the air will be continued in the direction to where it is most attenuated. The furnace ventilation depends entirely on the rarefaction and consequent lightness of the upcast column, for the difference in the weights of the two columns produces a difference in pressure. So far as setting the air in motion in the mines is concerned, furnace ventilation is all right in deep mines, but in the case of mines of moderate depth, it is feeble and expensive,

because the consumption of coal to produce a small amount of air is out of proportion to the work done, and even in deep mines, where much inflammable gas is given off by the workings, the furnace becomes a source of danger. It is, therefore, not a reliable mode of securing either a cheap or safe ventilation. The construction of a ventilating furnace is very simple, and therefore needs no detailed description, but it is important that the dimensions should be such as will give the requisite ventilative current in warm or unfavorable weather, without forcing, so that there may be a margin of power for extra occasions. In proportioning the dimensions, perfect combustion of the coal should be provided for in order to obtain the maximum of effect for the coal consumed. The space over the top of the fire, through which the air passes to the upcast shaft, should also be provided with arrangements whereby it may be reduced or increased at pleasure, within certain limits, for the purpose of regulating the combustion of the coal. Some mine foremen in this State are laboring under the impression that by filling the grate over the bars with coal will insure good ventilation, which is practically and theoretically wrong. A wide furnace will do better service than a high one of same sectional area, as it admits of a thin fire over a larger surface which causes perfect combustion, and the more effectually heats a larger amount of air as it is thus made to pass over it.

The fan has long since been considered as affording the best method so far discovered in producing a ventilative current in all kinds of mines; but while mechanical ventilation possesses many advantages over furnace ventilation, it also has its defects in some respects. Concerning these advantages and defects there has been much controversy between practical and scientific men, and both sides have been exaggerated. One advantage offered by the fan is that it is built on the surface, and is therefore, independent of conditions existing underground, a circumstance very important in case of an explosion.

The fan is not subjected to changes by the temperature of the atmosphere, as the merit of it lies in the fact of its rarefying the air without increasing its temperature. The principal advantage claimed for the fan is its economy, estimated on the relative consumption of fuel. Ventilating fans have from time to time undergone great modification and improvement, both in their general design and in the details of their construction. Formerly there were two classes of fans constructed, namely, that which forced the air into the mine, and that which exhausted it. Each inventor and constructor of the

respective fans was always claiming superiority for some particular merit or efficiency attached to his own invention.

But of late years the constructors of fans have so improved them, that they are now built with doors and shutters attached to the casing so that the direction of the air can be changed from forcing to exhausting, or vice versa, in one minute, without stopping or slackening the speed of the fan.

The question has often been asked the Inspector, "when does the fan give the best results, when forcing or exhausting?" and indeed the question is hard to answer, as no general answer can be given, and must be determined at each mine according to the circumstances presented but as both have advantages and disadvantages, it is used in both ways according to the requirements of the mine.

Authors on mines and mining have spent the greatest portion of their lifetime devising the best, safest, and healthiest method in operating same, and so perfect has the construction of mechanical appliance become to produce air in mines, that there is no further excuse for any mine superintendent or mine manager to have a poorly ventilated mine at this late date of modern improvement in mine ventilation, and a mine manager cannot expose his incompetency and neglect, plainer than to allow the miners under his management, work in a vitiated atmosphere. A well ventilated mine is the salvation of the miner, and whenever we find a sweeping current of fresh air freely circulating through the mine, life is furnished to everything, the animate and inanimate. The miner works better, lives longer, and even the iron and timbers are preserved from rust and decay, while foul air in a mine not only works an injury to the health and energies of the miner, but also produces a decidedly bad effect upon everything employed in it. There are two distinct modes of ventilation: The first is that of a uniform current wherein the current travels continuously in an uninterrupted circuit throughout the whole mine; the second is the multiple system in which the main current is divided into different districts, each furnishing a separate supply of fresh air.

Formerly the pernicious custom was prevalent (and it has not yet been wholly abandoned), of ventilating all the excavations of the mine in one undivided current from the point of ingress to the point of egress, taking in every working place on its route. By this method the ventilative current often has to pass through worked out and abandoned places, thus gathering all the impurities of the mine on its way before it arrives at points where most of the miners are at work, and thus the men have constantly to breath vitiated atmos-

phere, a consequence of very grave importance. The opposite of the above pernicious arrangement, and the only proper and practical one is to convey the air first, and as directly as possible from the down-cast to the working places of the miners, and back as direct as possible to the upcast. A primary principle of mine ventilation is that the air current should never pass old workings before it is used by those engaged at the working place, and we know of no circumstance or condition existing at any mine in this State to hinder or prevent any mine foreman or manager from practicing this method at their respective mines. The second mode of ventilation is the multiple system. The main current by this mode after entering the mine is divided by a process known as splitting the air, which constitutes the most important improvement in mine ventilation of modern times. After the separated splits have ventilated the separate districts they reunite or form junctions with the main circuit, and then the whole volume of air is removed from the mine in a uniform current just as it entered. By splitting the ventilative current into parts and ventilating separate divisions of a mine with independent currents, the atmosphere is not only made purer and better, but it will add greatly to its quantity, and by thus enlarging the area will reduce the velocity which will greatly lessen the friction in comparison with the quantity of air circulating, and so furnish an increased quantity with the same ventilating pressure. The splitting of the air system of ventilation has many other advantages. It increases the quantity, gives more fresh air to each working district, does not carry the noxious gases from one district to another, and does away with doors on the roadways. I am pleased and proud to state that this system is liberally practiced at all of our larger mines. In fact we have a few mines in this State, where the ventilating current is divided into six separate parts, and each part ventilating so many separate divisions in the mine, and giving plenty of fresh air to each part. Indeed, we have mines with the ventilative provisions and general arrangements for the safety, health, and welfare of the miners so admirably arranged as to be a credit to the state, or to any other coal mining state in the Union.

Every mine manager or mine foreman on assuming the responsible position of taking charge of a mine where so many of their fellow beings are employed and dependent on their competency and ability for their health and safety, should study the above fundamental facts thoroughly in order to fit themselves for the important position they hold, and render satisfactory service to employer and employee. They

should make a thorough investigation daily of every portion of the mine, and ascertain if the ventilation therein was sufficient for the removal of deleterious gases and foul air accumulated in the mine and if every miner working therein was being furnished with enough pure air. As every year's labor in a mine is over new ground, the air passages are required to be carried forward as the openings are extended. More pressure and propelling force is needed or larger air way and greater sectional areas to keep up the quantity and volume of air as the rubbing surface increases. The ventilative current in traveling through the mine naturally tends to take the easiest course from the downcast to the upcast shafts; this course may be either the shortest, or the one of largest sectional area. It is therefore necessary that the return air course should have an area fully equal to that of the intake from which they receive the air. In fact the return airways should have a larger sectional area than the intake, because the ventilating current is heated in its passage through the mine, and consequently its volume is greatly augmented. Too frequently the airways are neglected until they become almost choked with dirt in many places, and are so cramped in sectional area as to greatly retard the passage of the air, and yet the careless foreman is at a loss to know why he has not a greater current of air in the mine, expecting a choked aircourse to conduct the full volume of air as freely as required. In a mine where a furnace is used to produce the ventilation, too much tardiness is practiced by mine bosses in starting the fire in the mornings: During the night while the fire is banked, the circulation almost stops and an accumulation of foul gases is constantly forming, consequently the furnace should be started early enough in the morning to have all such accumulation swept away and a steady stream of fresh air flowing through the mine before the miners enter. Where fans are used, my attention has often been called to the practice of stoppping them through the night as a matter of economy, and where the mines are extensively worked, an enormous quantity of black damp accumulates which the miners must inhale every morning owing to such economy and neglect. On visiting some of our mines we find the fan running very slowly and fire in furnaces almost all burned out, plainly showing the condition of things in general in those mines. After entering the mine we find the ventilative current weak and defective, but before we travel very far, we noticed the ventilation improving, and by our experience as mine inspector we have lived to learn that there is an understanding between the pit boss and his men to stir things up as soon as the inspector enters the

mine. The fan is quickened at the rate of 30 to 40 revolutions per minute, and props and cap pieces thrown on to the furnace to make air, and in a little while a strong sweeping current of air is found traveling through the mine thus proving that the ventilative appliances are available to furnish the required quantity of air in the mine if properly attended to. The miners always have good air when the inspector visits the mine, and in general believe that the mine inspector notifies the mine owner of his coming, which is an outrageous misconception, and defy any man to prove it. I here state emphatically and truthfully that I have never informed any mine official of my intention of visiting his mine at any certain date. As we have already mentioned in former reports that there is no one in a mine that should be better able to judge of the requirements of a mine than the pit boss, for the ventilation as well as the sanitary condition depends greatly on his competency and faithfulness in attending to his duties, and when he fails to execute these duties, thus causing the miner to inhale impure atmosphere which injures and undermines his health, that foreman or pit boss is nothing less than a criminal and should be punished accordingly. I have often been tempted to be more personal in my remarks on mine ventilation, but waiting reform has never come in some instances, but I shall be a little plainer in my next report if things continue in their present condition at some of the mines.

MONTHLY PAYMENT OF WAGES AND THE COMPANY STORE.

The monthly payment of wages and the company stores have been a source of contention between coal operators and miners for many years. Legislation with a view to the suppression of these twin evils has been attempted several times ineffectually. The truck store system is the offspring of monthly payments; the long deferred pay day making acceptable any relief to the miner in carrying him from one month to another. If we accept the proprietor's view of the company store, it is made to appear a very innocent and harmless institution, designed and originated chiefly for the accommodation of the miner; he will omit, however, any reference to the sure and satisfactory basis upon which the store is established and the rich revenues derived therefrom.

The miner's view of this character of store, arrived at not by choice but by force of circumstances, has the matter brought home to him from an altogether different standpoint. Take for example a miner at work for an operator who pays once a month; he begins

work on the first day of January and continues through the month and until the fifteenth or twentieth of February, before he secures pay for his January labor, nearly seven weeks from the time he commenced. He is bound to support himself and family during this seven weeks and the question naturally arises how does he do it? The answer is easy. When the miner has earned a few dollars he is privileged to take up the amount so earned, in scrip or other order on the company store on application at the office of the coal company; this scrip or order having no purchasable value at any other than company store where it is issued, confines his trading to this one store. It is not an unusual case by any means when a miner before his pay day arrives, finds his month's wages mortgaged for the full amount due him. One has not to draw on his imagination to any great extent to see in the company store a species of trust; see its operation, the pay days are fixed as far apart as is possible so that the issue of scrip becomes a necessary evil, this scrip having no value except at the company store, no other store can live in the neighborhood and thus competition is destroyed. With nothing to fear from competition, prices are fixed so high on all supplies that earnings are absorbed as fast as made.

This is not the only evil associated with the company store, for to avoid the payment of money as much as possible for labor on pay days, the company crowds the mine with miners to its fullest capacity, (married men with families being preferred) resulting in a smaller turn in. To more fully explain what is meant by a "smaller turn in," means to purposely crowd the mines with miners so that the daily output of coal will be divided up to a larger number of men; thus reducing the average earning of each. In other words a smaller number of men with the opportunities offered would furnish the same daily output; but the larger number make so many more customers at the store and a correspondingly less sum of money to pay out on pay days. The affect of which is that the store does a thriving business while the greater number of miners are made to subsist from hand to mouth, with discontent and poverty on every side. When a slack time approaches the single men are discharged and the men with families to support and a company house to rent are retained.

Operators that pay semi-monthly and keep no store are at a disadvantage when in competition with this other class in the sale of coal, for the reason that owners of company stores can enter the market and under sell them, relying on the store for a margin of profit.

In a community where the company store flourishes the effect upon the trade and prosperity of the place is as dangerous as the deadly upas tree; competing establishments are either ruined or driven out, business of all kinds droops and the dry rot does the balance. If it is strictly a mining community and the company store possessing the only medium of exchange—its scrip, then no other store has any business there. If a miner has the temerity to purchase goods at an outside store, it is only a question of time when he is given to understand that he is expected to do his trading where he gets his employment regardless of prices or the quality of the goods. In a conversation with an operator who was running a store, he said: "I have as much right to demand the patronage of my employees as I have to demand service of them in the mine after being employed and will not be dictated to by them as to prices or quality of goods." He was reminded that every man was entitled to pay for his labor, and the right to use that pay in the market of his choice was a cardinal principle of right due to every American citizen and that the denial of such right was nothing short of oppression. It will be conceded by all that the lot of the coal miner is one of toil and fraught with danger and if he frets under the yoke and at intervals comes out on a strike, usually one will not have to go far to learn that there were good reasons for his act.

Like most hard working men, the family of the miner is usually a large one, this in connection with the fact that in the course of a year there are many idle days in which he can not work if ever so much inclined, the earnings are necessarily small not only because of this but because of the price paid for mining; if on top of this he be made subject to the tyranny of the company store, and is prevented from entering the free and open market to purchase the necessities that his judgment and means dictate; what has become of his freedom? As a remedy for these grievances and this injustice there appears no cure like that to be had through proper legislative action. A law that will be operative in causing semi-monthly payments and prevent the stopping of money at the pay office will go a long way in banishing this evil. The truck stores and monthly payments are relics of a by-gone age, tainted with feudalism, conceived and matured in a foreign country, unamerican in spirit and must go if we expect contentment and advancement among our miners.

MINER'S OIL.

The legislature in 1895 enacted a law which established a grade for oils to be used in coal mines for illuminating purposes. For two

years thereafter the inspector conscientiously endeavored to enforce the law in compliance with his duty in the premises, appreciating as he did the benefits that must result from a faithful observance of the law. He met with such indifferent success in his efforts and due solely to a lack of support from the miners, that he gave up in despair; realizing the hopelessness of a task wherein he met opposition from the very parties who were expected to lend him assistance in suppressing an evil that affected them above all others. At present the law is to all intents and purposes virtually a dead letter so far as the grade used by the miner is concerned. The serious feature in the matter confronting the inspector is the fact, that the very men in whose interest and for whose benefit the law was enacted are its chief violators. All mines in the state employing a number of men are supplied with good and sufficient ventilating appliances, and with very few exceptions are there to be found mines lacking in a sufficient quantity of air to keep them in a healthy sanitary condition; yet the miners persist in the purchase of a grade of oil that gives off great volumes of smoke and fumes imparting to the air its poisonous impurities and all of which they are compelled to breathe and live in, and for what purpose do they suffer the inconveniences resulting, simply to save five cents on a gallon of the oil regardless of consequences which they must realize by experience.

The remedy for this evil can easily be applied by those who suffer from it. The miner is the sufferer and by concerted action, a rule could be adopted and enforced which would require every miner to buy the same grade of oil. The operator could very materially aid in such move, in fact he could go a step further, he can keep a grade of oil for the use of the miners, sell it at a reasonable price and require all miners employed by him to purchase of him. This plan would simplify the duties of the inspector in testing oils, he would then expect to find the oil used in a mine in its original receptacle at that mine and then and there test it. This is a suggestion, but if a better one can be produced it will be most acceptable. As it is the betterment of the oils used and the air of the mines that is of interest, but without the co-operation of the miners the inspector can do nothing.

STRIKES.

For the first ten and a half months of our fiscal year, ending June 30, 1899, ^{over} ~~no~~ mines were actively at work. Peace and quiet prevailed very generally; here and there a strike local in its nature and free from any serious trouble would occur, but all were of short duration

and many of them successful. Not until about June 1, 1899, did anything of a serious nature occur. At this date, however, in obedience to a call made by the United Mine Workers Association of America, our miners suspended work in several of our largest mines. This suspension of work was not due to grievances on the part of our miners, but was what is termed a "sympathy strike," in aid of their fellow miners on a strike in the Indian Territory at a place called Ludlow.

From what is learned of the strike it appears that it originated in the Territory as a result of the discharge of some sixty miners who were members of the U. M. W. Ass'n of A., this action precipitated the strike, which eventually spread to Arkansas, then to Kansas and still later to this state.

During the month of March a convention was called at Fort Smith, Ark., here the above named association formulated a demand to be made by its members upon the operators. This demand in effect, required the coal companies to recognize the association, to accept a scale of prices which increased the price for mining, that eight hours should constitute a day's work and that pay days should be semi-monthly instead of monthly.

The force of this strike apparently was directed against what is known among the miners as the "Big Four" for the reason that they had refused accede to the demands made or even recognize the organization. The Big Four embraces the following companies: The Southwestern Coal & Improvement Company, The Western or Rich Hill Coal & Mining Company, The Central Coal & Coke Company, The Kansas & Texas Coal Company.

The aim of the association of miners was to cripple the above concerns and to this end the miners were called out wherever these companies had mines.

The beginning of the strike in this state, was the order of the association calling out the miners employed by the Kansas & Texas Coal Company. This call was promptly met by our miners so employed and to a man they came out, there being between 600 and 700 of them that quit work.

The next call was made upon the miners of the Rich Hill Coal & Mining Company. This call, however, was not so successful as only half of the miners responded to the call, the others continued work and eventually the mines were running full force; for in the meantime the coal company offered voluntarily a scale of prices which seemed to have met favor with the miners as the mines were promptly filled with men.

Randolph county was then called upon to aid in the strike, and a demand was made upon the Interstate and Elliott Coal Companies to reduce their output one-half. The Interstate Coal Company would not submit to the demand preferring to shut down altogether. The Elliott Coal Company, however, was furnishing a trade of twenty-five years standing, and to maintain which it submitted to every condition imposed by the new and as it thought arbitrary conditions asked for by the association of miners. These conditions were a recognition of the United Mine Workers' Association of America; increased pay for mining, semi-monthly pay days and to work half time. Notwithstanding this complete compliance with every demand made upon it, there comes an order from the association headquarters in Indiana, to suspend work at the Elliott mine altogether.

The miners as well as the operators of Missouri are peculiarly situated and are seriously handicapped by their surroundings. With Illinois and its immense coal field immediately bordering us on the east, Iowa on the north, Kansas on the west and Arkansas on the south, we are completely encircled by coal fields with thicker seams of coal, better roof and other advantages all tending to a cheaper and more economical method of mining. These very decided advantages possessed by our neighbors, largely and almost exclusively confines our coal trade to our own borders; in other words our output is controlled by our home consumption. Did we control our home trade our output would be many times larger than it is. Unfortunately our trade is invaded by each one of the states named. Take for instance the tremendous coal trade of St. Louis alone and reckon what a demand it would make upon our mines if we controlled it; but to the contrary we find the Missouri coal completely shut out of St. Louis, by its close proximity to the Illinois coal field and the cheapness with which it is mined and delivered to that great city. At Kansas City where we should find our next best market, we have to be satisfied with a very small trade as Iowa and Kansas secures the major portion of it. The counties nearest Kansas City have such small seams of coal as to make competition very difficult because of the expense in mining thin seams. In the southwest we have a good coal field and the market in the lead and zinc region is a good one, yet Kansas and Arkansas secures the lion's share of this trade. In the counties of Macon, Randolph and Bates, where we find our best and largest seams of coal, the railroads consume most of the output as fuel in carrying their trains and traffic through the state. Situated as we are and sur-

rounded by such barriers, we plainly see that our coal trade is confined to the limits of the state and that competition with our sister mining states is next to impossible. This virtually localizes our trade, and turning to our miners our sympathies go out to them when we notice the natural difficulties they have to contend with and the troubles met with and to be adjusted in all mining camps; but when in addition to all this we find that while circumscribed in their field of supply and demand that they are compelled to share in the troubles foreign to our conditions and our state, sympathy for them is naturally increased.

Following is an account of the strikes by counties:

STRIKES BY COUNTIES.

ADAIR COUNTY.

The miners employed by the Rombauer Coal Company came out on a strike September 1, 1898, after demanding an advance of ten cents per ton and its refusal by the company, as it was considered under all the circumstances surrounding the situation as a very unreasonable demand. The miners after having been out two months and a half effected a compromise, based upon a reduction in the price to be paid for powder together with other details of minor importance. On the ninth of November the men returned to work without any advance in the price for mining having been allowed. There were about fifty men involved in the strike.

September 1, 1898, the miners employed at the mine of the Watson Coal Company, came out on a strike because of a refusal to increase the price ten cents on the ton for mining. This company works the same seam of coal as the Rombauer Coal Company, paid the same price for mining and other conditions similar. The same settlement was agreed upon as above and work commenced again on the ninth of November. There were engaged in this strike about forty-five men.

BATES COUNTY.

During the first week of June, 1899, the officers of the United Mine Workers Association of America, made a request of the miners employed in the Rich Hill district, embracing parts of Bates and Vernon counties to suspend work in sympathy for their fellow workmen in the states of Arkansas, Kansas and the Indian Territory. The request was complied with by the miners at work for the Arthur, Bedford, Bruce & Rees and Vernon Coal Companies, also at one or two of the

mines of the Rich Hill Coal and Mining Company; with the miners of the latter company, the stoppage of work did not mature into a general suspension, as the larger mines continued work and the men that did go out soon returned to work again; the operators agreeing to a scale of prices regardless of the demands and requests of the officers of the United Mine Workers Association. The generous and tactful treatment accorded the miners of the Rich Hill Coal & Mining Company by its superintendent upon many occasions, must have had its influence upon them.

The sympathy strike also brought out the miners employed in the mine of Robt. Pearson. After being out about ten days, one half or nine men returned to work at an advance in price of eight cents per ton; semi-monthly payment of wages, with fifteen days in hand held back.

The sympathy strike also caused a small number of the miners at the mines of the Bruce & Rees Coal Company to come out. The greater number continued at work on an advance of eight cents per ton, and semi-monthly payment of wages.

The miners employed by the Rich Hill Coal & Mining Company at mine No. 15 came out on the call for a suspension of work in sympathy for the miners of Kansas, Arkansas and Indian Territory. After having been out a few weeks they returned to work on the company's terms.

LAFAYETTE COUNTY.

The miners employed by the Corder Coal Company came out on a strike about the first of January, after being refused their demand for an increase of twelve and one-half cents per ton for mining. After the strike had lasted about ten days the company complied with the demand, but on March 1, the company notified the men that it would reduce the price twelve and one-half cents. The miners again came out insisting upon a continuation of the advanced price. After having been out about ninety days they returned to work at old prices. Some fifty men were engaged in the strike.

The miners employed by the Lexington Coal Company came out January 1, being refused an advance of twelve and one-half cents per ton as demanded. After being out on a strike ten days the company granted them the advance asked for and work was resumed; but shortly after this the miners made a further demand on the company for an additional advance of twelve and one-half cents per ton; this was refused and the men continued work. There were 450 men involved in this strike.

The Diamond Coal Company miners came out on a strike January 1, an account of a refusal to advance the price of mining twelve and one-half cents per ton. After being out ten days the company granted the advance asked for and work was again resumed. A further advance of twelve and one-half cents per ton was demanded March 1; this was refused and the men went out and so remained until May 20, when they returned to work at the old price. About twenty men engaged in this strike.

There was a strike of the miners at work for the Salt Fork Coal Company, January 1, because the company would not grant their demand for an advance of twelve and one-half cents per ton. After being out eight days the company complied with the demands and work commenced again; but in a short time another demand was made for an additional twelve and one-half cents per ton advance, which was refused, whereupon the men came out and remained out until May 20, when they returned to work at the old price. There were forty-five men in this strike.

MACON COUNTY.

The miners employed at what is known as the "Contract Mines" belonging to the Kansas & Texas Coal Company and located at Ardmore, came out on a strike the first week in April, 1899, because an advance of five cents per ton was refused them. All other mines in the district embracing Macon and Randolph counties were paying fifty cents per ton for mining unscreened coal, while the "Contract Mines." referred to at Ardmore were paying but forty-five cents per ton for same class of work. The maintenance of the district price being feared as a result of this difference, a delegation from the mines of the district was sent to Ardmore to prevail upon the miners there to demand the fifty cent rate and thus make a uniform rate throughout the district; to this proposition the Ardmore miners willingly consented and at once brought their tools out of the mines. After being out about six weeks their demands were acceded to and the men resumed work at the district price. There were 250 miners in this strike.

The Little Pittsburg Coal Company, refusing a demand for an advance of fifteen cents per ton, the miners came out on a strike January 16, 1899. The coal company contended that it could not pay the price demanded and work the mine at a profit, as contracts had been made based upon the former price paid for mining. After being out about seven weeks the miners returned to work upon the same terms

and conditions which existed prior to the strike. There were seventy men engaged in this strike.

The miners employed in the mines of the Kansas & Texas Coal Company located at Bevier and Ardmore, suspended work the latter part of May of this year, on a call made by the leaders of the miners organization. There existed at the time neither grievance or misunderstanding between the company and its employees in this county. The suspension was due to sympathy (thus exercised) for their fellow miners working for same company in Arkansas, Kansas and Indian Territory, and who were on a strike for the purpose causing a recognition by the company, of the organization of which they were members. The request for a suspension of work on the part of the miners in this state, was made in order to curtail the production of this company. There was no change in the condition of affairs until the twenty-ninth day of last June, when a convention assembled at Moberly, composed of operators and miners, when the following scale of prices and agreement was adopted:

CONTRACT.

This agreement made and entered into this 29th day of June, 1899, by and between the undersigned operators of the State of Missouri, parties of the first part, and the Executive Board of District No. 14, U. M. W. of A., parties of the second part, witnesseth:—

Section 1. We agree to buy and pay for coal on a mine run basis as follows: In Bevier, Huntsville and Rich Hill Districts, 55 cents per ton; at Marceline, \$1.00 per ton; in Richmond and Lexington Districts, 95 cents per ton; at Higbee and Elliott, 80 cents, and at Vandalia, 86 cents per ton, for clean lump coal. The above prices will be in effect from the 1st day of August, 1899, until the 1st day of September, 1900; which latter date will be considered the beginning of each year.

Section 2. To protect operators from being imposed on by unfair dealing and to elevate the standard of workmanship among the men, the operators reserve the right to discharge any miner or miners who send out mine run coal which is declared below grade by the weighman and checkweighman also that the quality of mine run coal must be practically free from sulphur, slate, clay and dirt.

Section 3. The following prices will be paid for dead work after the 1st day of August, 1899: In Bevier, Rich Hill and Huntsville Districts, for room turning, \$2.50; Marceline, Richmond and Lexington Districts and at Higbee, Elliott and Vandalia, for room turning, \$4.00.

The following prices will be paid for entry driving in Bevier and Huntsville Districts: For 12-foot entry, 55 cents per yard; for 7-foot entry, 96 1-4 cents per yard; for 6-foot entry, \$1.10 per yard. In Rich Hill District, for 12-foot entry, \$1.00 per yard; 8-foot entry, \$1.50 per yard. In Bevier, Huntsville and Rich Hill Districts, for brushing roof and raising bottom, 55 cents per yard to make entries 5 feet high from the rail.

The following price will be paid for going through horse back \$1.10 per foot and the regular entry yardage in entries. Nothing will be allowed for storing dirt, the yardage allowed being considered an equivalent. All cross-cuts between rooms will be paid for at the rate of 55 cents per yard and all rooms will be confined to width approved by mine superintendent.

Section 4. On and after September the 1st, 1899, eight hours actual work shall constitute a days work, no part of the eight hours to be used in lowering or hoisting men. We agree to pay for eight hours actual work as follows: For road and timber men \$2.00 per day; for drivers and cagers and all other underground men, \$1.75 per day; for trappers, 75 cents per day.

Section 5. The price of powder shall remain \$2.00 per keg during the life of this contract.

Section 6. The checkweighman shall have a check number for himself and for collections same as a miner to check off his pay and collections adopting what is known as the "check off" system and he will be paid by the miners.

Compulsory collection of doctor's bills will not be made but will be collected from lists signed at the option of the miner.

Section 7. Payment of wages will be made semi-monthly.

Section 8. All miners engaged in room and pillar mines are to use due and workmanlike care to keep their rooms clean and safe. They will be held responsible for the condition of their rooms from mouth to face under ordinary circumstances. All necessary timber and rails shall be delivered at the working switch of each place by the company.

Section 9. For the prevention of stoppage of work for petit grievances the following plan will be adopted: When a difficulty arises between a miner or miners or day hands and an operator which can not be settled by the mine superintendent and the pit committee the same shall be referred to a board of arbitration which shall be appointed, consisting of two operators of the district and two miners; and if these four can not agree they shall choose a fifth man. The mine or mines thus affected shall continue in operation pending the

decision of said board of arbitration and whatever decision shall be reached by a majority of said board, shall be final and binding on all parties.

Section 10. It is agreed that on the 18th day of June, 1900, the operators and miners represented by the Executive Board and parties to this agreement respectively will meet on that day in the city of Moberly and go into session and continue in session to agree upon and formulate a new contract, and all differences that can not be amicably settled between the operators and representatives shall be settled by a board of arbitration, consisting of two operators chosen by the operators and two miners chosen by the Executive Board of miners, these four to choose a fifth member, and the decision of this board shall be final and binding on all parties to said arbitration.

We, the undersigned respective parties, of the above contract have read the same and fully approve of the provisions contained therein and bind ourselves to the faithful performance of the same.

Executive Board U. M. W. of A.

H. Bousfield, Vice-Pres.

W. E. Roberts,

W. M. Richards.

National Board U. M. W. of A.

John P. Reese.

Operators—

Northwestern Coal & Mining Co.

By J. H. Bovard, Vice-Pres.

W. S. Watson.

Marceline Coal Co.

By J. Heming, Supt.

Elliott Coal Co.

By J. C. Fleming.

Wm. Walton.

Bevier Black Diamond Coal Co.

L. J. Loomis, Treas.

June 29th, 1899.

On or about the same date that this convention was held the Kansas & Texas Coal Company imported about 200 negroes to Bevier to work in mine No. 61, and in the following month 200 more negroes were shipped in and put to work at the Ardmore mines and are there as this report goes to the printer.

The grievance on the part of the company was not so much a question of the rate per ton to be paid for mining, as it was the determination of the company not to recognize the organization known

as the United Mine Workers Association of America. The company proclaims a willingness to treat directly with its own employees, but not with the leaders of the above named organization.

There were 600 miners engaged in this strike.

RAY COUNTY.

The miners employed by the Kansas & Texas Coal Company at Fleming came out on a strike March 1, 1899, against a proposed reduction of twelve and one-half cents per ton for mining. The district price was eighty-seven and one-half cents per ton and all other companies were paying this price. This company, however, notified the miners that on the first of March the price for mining would be seventy-five cents per ton. This proposition was not acceptable, the miners brought out their tools and the mine remained idle until the first week in June, when the extraordinary happened, not only was the original price restored but an advance of two and one-half cents per ton was allowed; in other words while the miners were asking but eighty-seven and one-half cents, behold, they are given more than they ask for, ninety cents per ton for mining. It is generally agreed that there was more of diplomacy than philanthropy in this transaction. It is difficult to reconcile the attempt to reduce the pay of the miners fifteen per cent, and then in order to force them to terms remain idle three months, with the idea that there was a change of heart and out of the kindly feeling for the miner an increase price would be allowed them. The change of heart appears to have been influenced directly by a scarcity of coal, for about this time nearly every mine operated by this company in other states as well as our own were idle, and it had to have coal. There were seventy men involved in this strike the most of whom, however, had left before the strike was off.

About the first of July, all Ray county operators except one refused to sign the scale and the mines are idle; but as this is encroaching on another fiscal year, we pass it.

ACCIDENTS.

The number of accidents occurring during the year just closed is in excess of the accidents accounted for during the previous year; but this is to be expected as more men were at work and a greater amount of coal was mined. The proportion of preventable accidents in America and England resulting from carelessness, ranges between forty and fifty per cent of the total number of accidents. Our experience for the year shows that seventy per cent of the fatal accidents are

attributable to carelessness, while there was fifty-four per cent due to this cause from the total of both fatal and non-fatal. Carelessness as a result of mine accidents has attracted much attention and caused much discussion because of the large per centage of this character of accident. Among the many remedies that have been recommended, that of legislation has many advocates; for by which it is thought that in placing a fine or penalty upon those guilty of an infraction of the law governing carelessness, that many accidents may be avoided. The unfortunate feature attaching to laws of this nature, is that they will not be taken or considered seriously. To impose a fine upon one who had been so unfortunate as to meet with an accident has the appearance of adding injury to injury, and under the circumstances there are very few men who would want or wish to fine a man who had met with an injury. On the other hand the difficulty of convicting a man of carelessness would be that element of uncertainty is always associated, for so long as the party actually escaped injury in a dangerous place he would have the big end of the argument on his side. The only person who could have a reasonable excuse for assessing a fine, would be the pit boss or some person or persons delegated by him to look out for dangerous places. He could give the warning; but who is to remain with the miner to discover him in the act of carelessness? His Butty would not if on friendly terms, and in mines such as we have in this state, where there are several hundred rooms to be looked after, it would take a number of men to do the necessary watching to discover acts of carelessness especially if there was a penalty attached. If operators would publish and then instruct their pit bosses to promptly discharge miners guilty of acts of carelessness, and would prevent men without the requisite mining experience from working or compel such to be associated with practical men, much carelessness would be avoided and this character of accident become less frequent.

Out of the total number of accidents, three per cent were due to falling down a shaft, three per cent were caught by cages, five and one-half per cent were caused by windy shots, eight per cent to returning too soon on shots, thirteen and one-half per cent by contact with mine cars and sixty-seven per cent from falls of roof and coal.

Falls of roof and coal is the most prolific cause of accident met with in mines; it has always been so and will likely lead all others until the present method of mining is abolished or vastly improved.

Following will be found a detailed statement of the fatal and serious accidents:

FATAL ACCIDENTS.

BARTON COUNTY.

Guy Beam, a miner, employed at the Wear Coal Company mine at Vernon was killed by a fall of slate on the nineteenth day of July, 1898. The deceased who was only a boy 16 years of age was working with his father, and mining off some coal at the face of his room when a large piece of slate fell, killing him instantly, but the father escaped unhurt. The rock that fell on the boy weighed about four tons, and it took fully an hour to break it up and get the boy out. It fell without giving any warning, being cut out by a slip on one end, and running along the face of a horse back, feathering out towards the face, the thickest portion being next to the horse back. Shortly after the accident I visited the mine and made an investigation, and discovered an ample supply of props and cap pieces in the room, and with the exception of the effects of the slip and horse back, the room was in very good condition. The accident, while a very deplorable one, was one of those that can not seemingly be guarded against, and is another warning to prepare for unforeseen dangers which is often found and met in coal mines.

BATES COUNTY.

Henry Velrick, a miner employed at the mine of Wm. Lowder was killed by a fall of rock on the second of March, 1899. The deceased was mining off a standing shot when a large piece of rock fell, catching him under and killing him instantly. On examination I learned that the deceased was working in a room with a younger brother (the father who is also a miner being sick at home), and had fired a shot at noon, and after eating their dinner went back to work, and Henry (the unfortunate) commenced working off the coal loosened by the shot when a large portion of the roof fell and buried him under it. The other brother was caught by the rock but his injuries were slight. Deceased was nineteen years of age, and the main support of the family, the father being an invalid. The coroner's verdict was as follows: Accidental death from falling roof. No blame attached to mine operator.

John T. Johnson, employed by the Rich Hill Coal Company as shot firer at mine No. 20, was killed at said mine on the first of February, 1899, by a windy shot. Full particulars of this explosion will

follow these remarks. Johnson was 34 years of age, married and had a child.

Burrell Shumaker, employed by the same company, at the same mine as Johnson was killed by the same explosion. A detailed account and a full description of the explosion is given in an article written after a careful and thorough investigation the next day, and will follow these remarks. Shumaker was 32 years of age, married and had four children.

EXPLOSION AT MINE NO. 20.

On the evening of February 1, an explosion occurred at mine No. 20 of the Rich Hill Coal Company which caused the death of John F. Johnson and Burrell Shoemaker the two shot firers, but doing very little damage to the mine. Mine No. 20 is located about six miles northwest of Rich Hill, and is connected with the Missouri Pacific Railway by a spur switch. This shaft was sunk in October, 1897, and commenced the shipment of coal in November, of same year, and therefore is a new mine, but has been developed very rapidly. The shaft is 83 feet deep and is equipped with first class machinery; the ventilation being furnished by a twelve foot fan and is one of the best ventilated mines in this or any other mining state in the Union. The mine is opened out on the double entry room and pillar plan and is practically operated. The ventilative current is conducted around the workings in three separate divisions, and each division ventilates a different section of the mine and furnishes more than double the amount of air required by law. The fan at date of the explosion was forcing and the air was split at the bottom of the downcast to the north and south sides, and traveled first over the first west entries on each side, the current going into the south side was split again after ventilating the first, second, third and fourth west entries, part of it traveling to the first and second east entries, while the other part ventilated the third and fourth east entries and the whole volume again united and escaped through old mine No. 13, which had an underground connection with mine No. 20. I was notified of the explosion on the second and reached the scene of the accident on the morning of the third and proceeded at once to make a thorough and careful investigation as to the cause and damage done by the explosion. The mine was in the same condition as it existed immediately after the accident occurred, nothing having been done besides taking out the dead bodies of the two shot firers. On investigation I learned that the shot firers entered the mine together at 5:30 p. m. and at

once commenced firing off the shots prepared by the miners during the day, and had succeeded in firing all the shots on the north side of the shaft as well as the shots in the first, second, third and fourth east entries, also the shots in the third and fourth west entries on the south side, and all except two rooms on the second west when the explosion occurred. The accident occurred fully an hour before the exploring party entered the mine and the bodies of the shot firers would have remained longer undiscovered except for the anxiety of the eight men who constituted the night force, and were in the engine room waiting for the shot firers to come up before they entered. There was no perceptible sound or effect of the explosion heard or felt at the pit top, and when those men realized that the shot firers were later than usual in coming out, notified Mr. James, the foreman of the fact, and at about nine o'clock Mr. Price with others immediately entered the mine and soon smelt the odor which usually follows a windy shot, and the rescuing party had not proceeded very far before they discovered empty powder cans and oil cans scattered about and tool boxes shattered to pieces. They also discovered that the explosion had occurred on the south side, and on entering the first west they had not gone more than 100 feet inside of the door when they found Burrell Shumaker lying on the track dead, with two ugly holes in his head from which a large pool of blood had oozed. The surroundings indicated that he had just entered the entry and was on his way to the face to meet Johnson when he encountered the force of the air generated by the windy shot and was hurled against the coal in the sides of the entry. His torchlight was found about eighteen feet inside where his body lay showing plainly that he was blown that distance, his knife and watch being found between where the lamp and the body was found, and his cap being blown out to the south entry, a distance of about one hundred feet. Johnson's body was found on the second west entry between rooms Nos. 20 and 21, and about seven hundred feet from where the body of the other shot firer lay. Johnson was lying face downward with both arms under his head, and his condition showed that he died from suffocation, there being no marks upon him, except slight burns on his back, his body being warm when found. The effect of the explosion was limited to the first and second west entries where a large number of oil cans and powder cans were scattered about and broken open, and tool boxes shattered to pieces. Other parts of the mine were not affected. On examination I discovered that the explosion occurred in room No. 20 from the effects of a windy shot, some charred coke being discovered on the props in the immediate surroundings of the explosion, and on

a pit car standing on the entry directly opposite the shot, I can not say that coal dust played any part at all in it. The room where the windy shot was fired was perfectly dry, as also all the adjoining rooms. Both the entries where the effect of the explosion traveled were dry and dusty, and yet there was no sign of charred coke dust to be seen except in the immediate locality of the windy shot, and the charred coke discovered at that point was caused by the sheet of fire and flame coming from the powder which was blown out of the windy shot, or possibly from the explosion of a keg (or a part of a keg) of powder, which we found on the entry broken open. The shot that caused the explosion was not a tight nor a badly prepared shot, and I considered the miner used good judgment in charging it with powder, and it would have been harmless except for a smooth parting which occurred below the center of the coal causing the powder to blow off the top and leaving the bottom part intact and making the resistance inferior to the force, the powder not having expended its power in extracting the coal, blew out in a sheet of flame and caused the damage already described. Undoubtedly Mr. Johnson had been firing the shots as rapidly as he could manage it, and the rapid firing of so many shots some of them greatly overcharged, not only had the effect of impeding the progress of the ventilative current, but the combustion of so much powder generated a large amount of carbonic oxide gas, together with the dry workings, every shot fired raised a cloud of dust, and with the air comparatively at a stand still, and the workings full of powder smoke, carbonic oxide gas, and coal dust, all that was needed to cause an explosion was supplied by a sheet of flame from a windy shot as the one already described. I was ably assisted in the investigation by the following parties: Mr. W. B. Williams, Supt., Jas. Price, foreman, John Jopling, master mechanic, and a practical mine official, Frank Price a miner, Otis Hawkins, a miner, and Mr. Robert Wilson, the latter being one of the oldest miners in Rich Hill, and one of the most experienced miners in the State, having followed mining nearly fifty years.

The disastrous effect of the explosion was confined to the first and second west entries, the rooms turned off these entries and every other part of the mine being found in normal condition, thus showing that its force was very limited. I also took part in the coroner's inquest and examined several witnesses who had worked in the mine that day, and who testified that it was in good condition. The mine is absolutely free from explosive gas as none was ever known to exist here in any quantity, and the mine is kept in excellent condition.

After a careful and painstaking examination of the mine and due consideration given all the evidence relating to the explosion, I find nothing calling for a censure of the Rich Hill Coal Company or its officers for any failure or neglect of duty; it was unavoidable on their part as there was nothing to indicate the slightest evasion of the mining law, but on the contrary, every evidence of a complete compliance with the same.

The two unfortunates who lost their lives in the explosion were practical miners. Mr. Johnson having worked in the coal field of Rich Hill over fifteen years, and was a sober, careful man, and both were well versed in the work of shot firing, and we look at this accident as almost unavoidable. Too much haste perhaps may be attributed to Johnson in firing, and if more time had been allowed to elapse between the firing of each shot there would have been no explosion of any extent, and it is as strange as it is true that while the shot firers realize their danger, yet in order to get through their work rapidly will take such chances of losing their lives. This company will not hire any man to do the shot firing unless he is a sober and competent man, and it has very rigid rules to govern the firing of shots, but while alone in the mine it seems that everything disappears from the minds of shot firers but anxiety to get through with the work and go home, and in many instances the results are like the present one; the sacrifice of their lives. Shot firers are paid at the rate of \$2.50 per shift, and the work to be done at each shift could be accomplished in five hours with perfect safety and security.

LAFAYETTE COUNTY.

Richard Tabb, a miner, employed at the Bonanza mine was killed November 17, 1898, by a fall of coal and slate. On my examination shortly after the accident, was informed that the deceased was lying down undermining when the accident occurred. He knew that the slate above him was loose, and was warned and cautioned of that fact by the miner that was next to him, but not being a practical miner did not realize his danger until it was too late, when the slate fell and covered him up. He was taken out alive, but died about three hours after the accident. The slate is about a foot thick and is taken down with the coal and built to make park walls. In fact the slate generally comes down with the coal, and it looks almost impossible for a man to be caught in that way in this mine. The coal is only seventeen inches high and a foot of slate making two and one-half feet in height. Above this is a rock roof no props being used. This shows

great carelessness on the part of the unfortunate to loose his life under such conditions. Deceased was fifty years of age, married, and had seven children. No inquest held.

MACON COUNTY.

Antonio Donati, a miner, employed at mine No. 46, Kansas & Texas Coal Company, was killed by a fall of rock September 15, 1898. Deceased was working in the eighth south entry drawing back pillars, and went across to the seventh to borrow a drill, and while in there was killed by the roof falling on him. Mug Woods and Harry Thomas who worked in the seventh south were also drawing pillars and warned Donati from going under the roof as they expected it to fall at any minute, the coal having been all taken out and that part abandoned. The miners working in the seventh expected the roof behind them to fall and take off the weight, and informed Donati of that fact and cautioned him not to go that way, but the distance back to his place of working being much shorter than going around the entry, he disregarded the warning and was instantly killed. Deceased was 35 years of age, and single. The coroner after examining a few of the witnesses who saw and knew all the particulars about the accident, did not deem it necessary to hold an inquest.

Thos. Poor, a mule driver, employed at Watson's mine, was instantly killed February 7, 1899, by a fall of rock. Deceased who was employed as a mule driver had made his last trip before the noon hour and had fed his mule, and with two other drivers sat down on a pile of timbers at the new switch to eat their dinner. They had been there only a few minutes when a large rock fell and caught Poor on the head killing him instantly. The rock was about seven feet square and thirteen inches in thickness. The other two drivers escaped unhurt, and the mules escaped injury by the rock leaning against the pit car and some entry timbers. The place was considered perfectly safe. There was no sign of any rock being loose or dangerous, and the drivers had picked that spot as the safest and had been sitting there every day previous to that, to eat their dinners. In fact entries are carefully looked after and well secured all over the mine. Deceased was 27 years of age, married and had one child. The coroner's verdict was accidental death.

RANDOLPH COUNTY.

Ed. Humphrey, a miner, employed at the Interstate mine was killed November 4, 1898, by falling down the shaft a distance of 110

feet. Deceased was coming up the shaft on the cage with other men at quitting time, and as usual the engineer stopped the cage at the ground landing to let the men off; there were eight men on the cage coming up and all got off safely except Humphrey, and as he was stepping off it seems that the cage moved causing him to lose his balance and fell backward into the shaft. This unfortunate boy who was only 18 years of age was very inexperienced and had only been working in the mine about two months. He was taken in as a helper by one of the miners, unknown even to the superintendent of the mine, and the man that had him in charge should have carefully looked after the boy's safety. There was no inquest held, but the coroner made an investigation, and pronounced it accidental death, and was unable to attach blame to any one.

Charles Johnson, employed at the Higbee mine, was killed December 26, 1898, by a trip of cars. Deceased was employed as a miner, and had been mining in a room by his father until the day of the accident; but the foreman being short of drivers hired him to drive for that day. The run where he drove had a down grade where the cars had to be spraged, and he being inexperienced failed to do so, and the full trip of five cars went down the grade at a rapid speed, and by some means caught him under them. There was no one near him when the accident occurred, but some time later another driver waiting for him to come back with empty cars and seeming longer than usual went to look for him, and found him dead between the cars, two having passed over him. This unfortunate boy was a grandson of the writer and it is very painful to write these particulars he being a namesake and having lived with him the greater part of his life. This mine was sunk and opened out by the writer in the year 1883, and while it has been continuously worked ever since and employing a large number of men, this is the first fatal accident which ever occurred at the mine, and very few non-fatal. Deceased was 20 years of age, and single. Coroner's verdict was accidental death.

John Salburg, a roadman, employed at the Elliott mine, was killed February 13, 1899, by a piece of soapstone falling from the roof catching him under it. I visited the scene of the accident the next day, and on investigation was informed that the deceased was brushing the road at one of the entries, and in wedging down a layer of the soapstone, the jar seems to have caused more to come down than expected, and a great piece weighing nearly a ton broke above his head in the shape of a pot hole which fell on his head and neck killing him instantly. He was a practical miner and a very careful man, and had worked in the mines since he was a boy. Deceased was 25

years of age, and single. The coroner upon examining some of the parties who knew how the accident occurred, did not think it necessary to hold an inquest.

J. B. Salter, a miner, employed at the mine of Jones & Davis' was killed June 15, 1899, by a fall of roof at the face of his entry. Deceased was loading a car when the accident occurred, and was at work between the face of his entry and the car when the rock fell covering him up and killing him instantly. The rock that fell was from eight to ten feet long, two feet wide and about ten inches thick. It was known to be loose and dangerous, and deceased was warned of the fact by other miners. He had worked but a short time in the mine, and was therefore unfamiliar with the nature of the roof, but unheeding the warning had to pay the penalty with his life. He was 32 years of age, and single. No inquest held.

NON-FATAL ACCIDENTS.

ADAIR COUNTY.

December 1, 1898, John Braden was seriously injured at Watson mine No. 3 by a fall of slate in the room of a miner he was visiting at the time. His injuries appeared to be from the hips down, and while no bones were broken, yet the skin on one of his legs was cut and slightly discolored. No one at the time imagined that he was seriously hurt as he complained of no pain except in his hips and would not consent to the employment of a doctor; but a day or so thereafter a doctor was called in and upon examination it was found that blood had been flowing into his bladder; failing to stop the flow of blood he died three days later.

BATES COUNTY.

November 14, 1898, W. W. Brown was injured at mine of J. C. Rankin, by a blast. Mr. Brown set fire to the shot and attempted to get out of the way, but did not succeed in getting far enough away as a piece of coal thrown by the shot struck him. He was not badly hurt and was soon out again.

March 15, 1899, Peter Dubray was injured at mine No. 21 of the Rich Hill Coal & Mining Company. Dubray was employed to work at night and engaged in driving a mule, he was called to assist in cleaning up an entry in which there had been a fall and while at this work a piece of slate fell on him breaking one leg and bruising his back.

February 15, 1899, Nqel Free was injured at mine No. 15, Rich Hill Coal & Mining Company, by a fall of coal. Free was mining off a standing shot when a peice of coal fell on him breaking his leg.

September 19, 1898, Alphonse Heck was injured at mine No. 15, Rich Hill Coal & Mining Company. Heck at the time of the accident was engaged in drawing pillars, and had a standing shot, while mining it off a piece of coal fell breaking one of his legs.

LAFAYETTE COUNTY.

January 2, 1899, F. P. Hardy was injured at the mine of the Allen Childs Coal Company by a fall of slate.

LINN COUNTY.

August 22, 1898, Martin Lara was seriously injured at the mine of the Marceline Coal Company by a fall of coal while under mining. Mr. Lara received injuries in the region of the bladder causing him severe pain; but his friends did not think his injuries would prove fatal and he was sent to the St. Joseph hospital where he died a few days thereafter.

October 10, 1898, Just Mis was injured while at work at the mine of the Marceline Coal Company. Mis was employed as a driver and while attempting to board a car on an empty trip, made a false step and fell. He was badly bruised up but no bones were broken.

October 3, 1898, C. H. Sambel was injured at the mine of the Marceline Coal Company by a fall of coal while passing the face of his room. The falling coal caught his left leg breaking the bone above the knee and also splitting the bone from the break to the knee joint.

January 3, 1899, W. P. Wilmott was injured at the mine of the Marceline Coal Company by a fall of coal which struck him on the leg, breaking the bone.

MACON COUNTY.

October 24, 1898, Wm. Andrews, employed at mine No. 7, Kansas & Texas Coal Company, as a mule driver and while making one of his trips had his hand caught between a loaded car and the side of the entry.

January 17, 1899, Andrew Bishop was injured at mine No. 46, Kansas & Texas Coal Company, by falling under a trip of loaded

mine cars. Bishop was employed as a mule driver and in coming out with a trip was riding the tail chain when the mule for some reason shied to one side causing Bishop to lose his balance and fall. He fell on his back between the rails and attempted to save himself by stopping the cars with his feet, but the momentum of the trip was too great as it doubled his legs back over his head, breaking his back and ending in his death two weeks later.

January 11, 1899, Samuel Clark was injured at mine No. 7, Kansas & Texas Coal Company by a shot which passed through a pillar into the room in which he was working. Clark was fully aware of the possible effect of the shot, the understood signal was plainly given but for some reason he failed to hear the signal for firing or perhaps he did not leave as promptly as he should have done. While his injuries were not serious, yet he was badly bruised and cut in the face by flying coal.

November 25, 1898, Joseph Chewinska was injured by a fall of slate at the mine of the little Pittsburg Coal Company. Chewinska was engaged as a mule driver and while in the performance of his work, was caught by a fall of slate. His face was badly cut, received a slight fracture of the skull and had his left eye put out.

August 15, 1899, James Cross was injured at mine No. 43, Kansas & Texas Coal Company. His partner fired a shot in their room.

July 17, 1898, Antonio Donatti was injured by a fall of slate at mine No. 46 Kansas & Texas Coal Company. The fall caught Donatti slightly cutting his face and spraining his ankle.

December 8, 1898, Wm. J. Jones was injured at mine No. 7, Kansas & Texas Coal Company. Jones was employed as weighman, but at the time of the accident he was attempting to pull a loaded car off of the cage, the cage slipped off of the wings causing the end of the car to drop and the car as it dropped caught his ankle badly bruising it.

May 6, 1899, Frank Lagrand was injured by a fall of roof in mine No. 7, Kansas & Texas Coal Company. Lagrand was at the time of the accident engaged in excavating a hole in which to set a prop to support his roof,* when a part of the same together with some coal fell, it struck the prop which in turn struck Lagrand, breaking two of his ribs and otherwise bruising him.

November 14, 1898, Thomas McDonald was injured at the Bevier Black Diamond mine by a fall of roof. McDonald was employed as timberman and when the accident occurred was in a stooping position digging a hole in the fire clay preparatory to placing in position

a set of timbers to support the roof, when a piece of the roof fell striking him on his right hip.

July 7, 1898, John Mariano was injured at mine No. 43, Kansas & Texas Coal Company. Mariano was engaged in mining at the face of his room when a portion of the roof fell on him bruising his side and back.

January 10, 1899, Ira Poor was injured at mine No. 7, Kansas & Texas Coal Company. Poor's employment was that of a driver and coming out with a trip on his entry he reached a junction point where a driver on another entry was also coming out, they collided and he was thrown from his car and caught between the car and the side of the entry. He was badly squeezed about the hips and stomach.

December 21, 1898, August Wiber was injured by a fall of coal at mine No. 43, Kansas & Texas Coal Company. Wiber was caught by a piece of top coal falling on him crushing him to the floor, causing injury to several of his ribs and bruising side badly.

May 3, 1899, Alex. G. Young was injured by a fall of coal at mine No. 43, Kansas & Texas Coal Company. He was engaged at the time in mining off a standing shot when a piece of the roof and a quantity of top coal fell on him. He was bruised considerably about the shoulders and back.

PUTNAM COUNTY.

September 6, 1898, Henry Fandree a miner at work in mine No. 4, Mendota Coal Company, was injured by a fall of roof. He at the time of the accident was employed in bailing water, and was in the act of reaching for his bucket to commence bailing into the water box, when a piece of roof slid off the side above the coal and caught his head between the coal and the water box. The bones in his face were fractured and he was otherwise very painfully injured.

February 22, 1899, Samuel Underwood was injured at old mine No. 4, Mendota Coal Company, by a fall of coal. Underwood as a miner was working on the longwall part of the work and was caught by a fall of coal at the face of his room which broke his leg in two places and crushed his foot badly.

RANDOLPH COUNTY.

September 30, 1898, Lawrence Dent was injured by a fall of roof at the Elliott mine. He was mining at the face of his room when a

piece of the roof fell on him and his partner also, but he received no serious injuries.

September 30, 1898, Frank T. Foster was injured by a fall of roof while working at the Elliott coal mine. He was at work mining at the face of his room when a piece of roof fell on him and his partner (Dent). Foster's left arm was badly broken and he narrowly escaped the necessity of having it taken off.

TABLE V—Showing Accidents in Coal Mines by

BARTON

Name of company or operator.	Name of injured person.	Date of acc't.		Occupation of employe.	Age.....	Single.....
		Month.....	Year.....			
The Wear Coal Co.....	Guy Bean.....	July 19	1898	Miner.....	15	1

BATES

The Rich Hill Coal & Mining Co.	Alphonse Heck.....	Sept. 19	1898	Miner.....	49	....
J. C. Rankin.....	W. W. Brown.....	Nov. 11	1898	".....	35	....
The Rich Hill Coal & Mining Co.	Noel Free.....	Feb. 19	1899	".....	33	....
" " " " " " " "	B. R. Shoemaker.....	" 1	1899	Shot-firer.....	32	....
" " " " " " " "	Jas. T. Johnson.....	" 1	1899	".....	34	....
W. H. Lowder.....	Henry Ullrich.....	Mch. 2	1899	Miner.....	19	1
Totals.....						1

LAFAYETTE

Bonanzo Coal Co.....	Richard Tab.....	Nov. 17	1898	Miner.....	50	....
Allen-Childs Coal Co.....	F. P. Hardy.....	Jan. 2	1899	".....	46	....
Totals.....						....

LINN

Marceline Coal Co.....	Martin Lara.....	Aug. 22	1898	Miner.....	34	1
" " " " " " " "	P. H. Sambel.....	Oct. 3	1898	".....	55	1
" " " " " " " "	Just. Mls.....	Oct. 10	1898	Driver.....	24	....
" " " " " " " "	W. C. Wilmott.....	Jan. 3	1899	Miner.....	22	1
Totals.....						3

MACON

Kansas & Texas Coal Co.....	Alex. G. Young.....	May 3	1899	Miner.....	35	....
" " " " " " " "	Frank Lagrana.....	" 5	1899	".....	42	....
" " " " " " " "	Antonio Donatti.....	Sept. 15	1898	".....	35	1
" " " " " " " "	John Mariano.....	July 7	1898	".....	38	1
" " " " " " " "	Jas. Cross.....	Aug. 15	1898	".....	43	....
" " " " " " " "	Wm. Andrews.....	Oct. 24	1898	Driver.....	33	....
Bevier Black Diamond Coal Co.	Thos. McDonald.....	Nov. 14	1898	Timberman.....	38	....
Little Pittsburg Coal Co.....	Jos. Chewinka.....	" 25	1898	Driver.....	21	1
*Watson Coal & Mining Co.....	John Branden.....	Dec. 2	1898	Miner.....	35	....
Kansas & Texas Coal Co.....	Wm. J. Jones.....	" 8	1898	Weighman.....	33	....
" " " " " " " "	Aug. Wiber.....	" 21	1898	Miner.....	45	....
" " " " " " " "	Ira Poor.....	Jan. 10	1899	Driver.....	22	1
" " " " " " " "	Sam'l Clark.....	" 11	1899	Miner.....	25	1
" " " " " " " "	Andrew Bishop.....	" 17	1899	Driver.....	29	1
Watson Coal & Mining Co.....	Thos. Poor.....	Feb. 7	1899	Driver.....	27	....
Totals.....						6

*Watson Coal & Mining Co., Adair county.

Counties for the Year Ending June 30, 1899.

COUNTY.

Married.....	No. of children.....	Non-fatal.....	Fatal.....	Insured? Yes.....	No.....	Amt of insurance.	Nature of accident.	Coroner's verdict.
....	1	....	1	.....	Fall of rocks.....	No inquest

COUNTY.

1	....	1	....	....	1	.....	Fall of coal.....	.....
1	....	1	....	....	1	.....	Blast.....	.....
1	....	1	....	....	1	.....	Fall of coal.....	.....
1	4	....	1	1	....	\$2,000	Windy shot.....	Death from windy shot.....
1	1	....	1	1	....	2,000	Windy shot.....	.....
....	....	....	1	....	1	.....	Fall of roof.....	Accidental; no blame.....
5	5	3	3	2	4	\$4,000		

COUNTY.

1	7	....	1	....	1	.....	Fall of roof.....	No inquest.....
1	....	1	....	....	1	.....	.....	.....
2	7	1	1	....	2	.....	

COUNTY.

....	....	....	1	....	1	.....	Fall of coal.....	No inquest.....
1	....	1	....	....	1	.....	.....	.....
....	....	1	....	....	1	.....	Mine car.....	.....
....	....	1	....	....	1	.....	Fall of roof.....	.....
1	....	3	1	....	4	.....	

COUNTY.

1	....	1	....	....	1	.....	Fall of roof.....	.....
1	....	1	....	....	1	.....	.....	.....
....	....	1	....	....	1	.....	.....	Coron'r viewed body; no inquest
....	....	1	....	....	1	.....	.....	.....
1	....	1	....	....	1	.....	Blast.....	.....
1	....	1	....	....	1	.....	Mine car.....	.....
1	....	1	....	....	1	.....	Fall of roof.....	.....
....	....	1	....	....	1	.....	.....	No inquest.....
1	....	1	....	....	1	.....	Cage.....	.....
1	....	1	....	....	1	.....	Fall of coal.....	.....
....	....	1	....	....	1	.....	Mine car.....	.....
....	....	1	....	....	1	.....	Shooting into adjoining room.....	.....
....	....	1	....	....	1	.....	Mine car.....	No inquest.....
1	1	....	1	....	1	.....	Fall of roof.....	Accidental death.....
8	1	11	4	....	15	.....	

ACCIDENTS IN COAL

PUTNAM

Name of company or operator.	Name of injured person.	Date of acc't.		Occupation of employe	Age	Single.....
		Month.....	Year.....			
Mendota Coal & Mining Co.....	Henry Faudre.....	Sept. 6	1898	Miner.....	30	....
.....	Sam'l Underwood..	Feb. 22	1899	"	47	....
Totals.....				.....	

RANDOLPH

Elliot Coal Co.....	Lawrence Dent.....	Sept. 30 1896	Miner.....	20	1
“ “ “.....	F. J. Foster.....	Sept. 30 1896	“	40	“
Interstate Mining Co.....	Ed Humphrey.....	Nov. 4 1896	“	18	“
Higbee Coal & Mining Co.....	Chas. Johnson.....	Dec. 26 1896	Driver.....	20	1
Elliot Coal & Mining Co.....	John Salberry.....	Feb. 13 1899	Roadman.....	25	1
Jones & Davis.....	J. B. Salters.....	Jan. 15 1899	Miner.....	32	1
Totals.....	5

VERNON

The Rich Hill Coal & Min'g Co.	Peter Dubray.....	Mch. 15	1899	Driver.....	23	...
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MINES—Continued.

COUNTY.

Married.....	No. of children...	Non-fatal.....	Fatal.....	Insured?		Am't of insurance.	Nature of accident.	Coroner's verdict.
				Yes....	No			
1	1	1	1	1	1	1	Fall of roof.....	.....
1	1	1	1	1	1	1	.....	.....
2	2	2	2	2	2	2	.....	.....

COUNTY.

1	1	1	1	1	1	1	Fall of roof.....	.....
1	1	1	1	1	1	1	Falling down shaft.....	Coroner investig't'd; no inquest.
1	1	1	1	1	1	1	Mine car.....	Accidental death.....
1	1	1	1	1	1	\$2,000	Fall of roof.....	Inquest unnecessary.....
1	1	1	1	1	1	1,200	No inquest.....
1	2	4	2	4	4	\$3,200

COUNTY.

1	1	1	1	1	1	1	Fall of roof.....
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TABLE VI—*Accidents.*

Cause.	Fatal.	Non-fatal.	Total.
Falling down shaft.....	1	1
Caught by cage.....	1	1
Windy shots.....	2	.....	2
Returned too soon on shot.....	.....	3	3
Caught by mine cars.....	2	3	5
Fall of roof.....	8	11	19
Fall of coal.....	1	5	6
Total.....	14	23	37

TABLE VII—*Accidents.*

Number of non-fatal accidents.....	23
Number of fatal accidents.....	14
Total accidents.....	37
Number of single men fatally injured.....	9
Number of married men fatally injured.....	5
Number of wives made widows.....	5
Number of children made fatherless.....	13
HOW INJURED PERSONS WERE EMPLOYED.	
Welghman.....	1
Roadmen.....	1
Timberman.....	1
Short firers.....	2
Drivers.....	8
Miners.....	24
Total....	37

INSPECTION BY COUNTIES.

ADAIR COUNTY.

Production, 104,868 tons.

Adair county is making a rapid progress towards the front rank of the coal producing counties of the state, having made a large increase in her output the past year as compared with previous one, and we may still look for a continual increase as new coal fields have been developed and new mines are opening up. There are two workable seams underlying all the north and west parts of this county; the upper vein crops out in the hills, and the mines are entered by drifts; the lower seam is about 125 feet below and vertical shafts are sunk to reach the coal. The upper vein is being worked at Stahl and points west, the coal varies from thirty-six to forty-two inches in thickness. The lower vein is being worked at Danforth and Novinger and will average forty-six inches. Of the more important mines operated under the head of their respective postoffices may be found a description of each.

DANFORTH POSTOFFICE.

Watson Coal Company. Wm. Watson, president; Wm. Rivers, superintendent, and Thos. Kelly, foreman. Mine located one-half mile east of Danforth and has shipping connection with the O. O. & K. C. R. R. Shaft 50 feet deep, equipped with good machinery for hoisting. The ventilation is furnish by a 10-foot fan which was circulating double the amount of air around the mine required by law. I made the first inspection of this mine on the eighteenth of August, 1898, and found it in excellent condition. The ventilative current is split at the bottom of the fan shaft to the north and south entries, and conducted to the working places of the miners giving plenty of fresh air in every working place. April 24, I made another inspection and found the ventilation with all other conditions entirely satisfactory.

The coal is about forty-five inches thick underlaid by hard fire clay and overlaid by a hard mixture of slate and soapstone which makes very good roof. The coal is extracted by blasting it off the solid. Fifty-five cents per ton was paid for mining run of mine coal. The mine is dry with good high roadways, and is practically operated. Fifty and forty men employed respectively at dates of inspection. The coal is consumed by the railroad company and local towns along the line.

KIRKSVILLE POSTOFFICE.

All the mines in the surroundings of Kirksville are located either on Hazel creek or on the banks of the Chariton river some of these mines are entered by drifts while one or two are operated by shafts using horse power for hoisting. All the mines are working the same seam of coal which is about forty-five inches in thickness, and of good quality. The coal is taken away from the mine in wagons and consumed at Kirksville and vicinity.

NOVINGER POSTOFFICE.

Rombauer Coal Company. R. G. Rombauer, superintendent and manager; Martin Rabbitt, foreman. Mine located about a mile west of Novinger and connected with the O. O. & K. C. R. R. by a switch. Shaft forty-seven feet deep and equipped with very fair machinery for hoisting. Ventilation is furnished by a ten-foot fan which produces plenty of air in the mine. I made an inspection of the mine August 18, 1898, and found it in first class condition with the ventilation double the amount required by law with all the safety appliances in good order. The fan at this date was set on top of an air chamber partitioned off at one end of hoisting shaft and forcing air into the mine. I made another inspection on the twenty-fourth of April, and again found the mine in excellent condition. The escape shaft was completed and the fan had been removed and set on top of it. A good stairway had been built in the escape shaft for the men to travel in case of an accident to hoisting shaft. The fan having a larger area to force the air into the mine was only making forty revolutions per minute and passing three times the amount of air required by law. Coal about forty-five inches thick and worked on the double entry room and pillar plan. It is underlaid by hard clay mining and overlaid by a good hard roof which is a mixture of slate and soapstone and easily secured with timber. The coal is extracted by blasting it off the solid; price paid for mining during the past year was fifty-five

cents per ton for unscreened coal. The roadways are high, wide, dry and clean and in good condition. From forty to fifty men found employed at dates of inspection. The coal is consumed at local points along the line of road.

STAHL POSTOFFICE.

American Fuel Company—W. E. Merlin, superintendent; John Sneed, foreman. This company owns and is operating two mines in this place. Both mines have drift openings, same coal seam is worked with an underground connection, and for all practical purposes may be considered as one mine with two openings. I made an inspection of mine No. 1 on the seventeenth of August, 1898, and found it in a very fair condition. The air was weak on the south side where I found several men at work in low coal prospecting and experimenting. The ventilation was better on the north side where the greatest number of the miners were at work. I made another inspection of this mine April 25, and found the ventilation weak and defective at several points owing to low and faulty coal, but every effort was made by the management to remedy the difficulties. As the advance face of the workings comes in contact with the low, faulty coal (the mine being worked on the longwall plan), every place had to be cut off and worked narrow through the fault and before air current was available had to be opened up again on the inside. This was practically opening a new mine and thus caused great expense to the company and annoyance and suffering to the miner. These faults cause the roof to become soft and friable and falls in the aircourses often occur, which greatly retards the air current. I found on this visit that another mine had been opened on the west side of the old mine, with an underground connection to the latter, but it is ventilated by a separate furnace. The new mine which is known as No. 2, is worked on the room and pillar plan and is well ventilated. I also found that arrangements had been made for the furnace of mine No. 2 to ventilate some parts of mine No. 1, thus equalizing the work the two furnaces had to perform and will doubtless prove beneficial to both mines. The coal varies from thirty-six to forty-three inches in thickness, and is worked now on the double entry room and pillar plan in the new mine, and on the longwall plan in the old mine. Price paid for mining, seventy cents per ton; employment is given to about one hundred men. The coal is taken to market over the O. O. & K. C. R. R. to Omaha and points west, but the railroad company consumes a large amount which is taken out of the chutes erected at the

mine to coal engines. The coal being of good quality sells very readily when once introduced.

Chas. Maywalt is operating a mine about three miles northwest of Stahl to supply local trade.

Spring Valley Coal Company. J. F. Stroop, superintendent. Mine located one-half mile east of Stahl, and has shipping connection with the O. O. & K. C. R. R. Mine entered by a drift, and ventilated by a furnace. The coal is about three feet thick and worked on the longwall plan. Mining is paid for at the rate of seventy cents per ton, and employment is furnished fifteen men.

CASTLE POSTOFFICE.

The North Missouri Coal Company, is opening out new mines about half way between Stahl and Castle, and several houses have been built for the use of miners. A side track has been laid and a tram-road track from the railroad to the mine has been constructed. The mines are entered by drifts, and same seam of coal will be mined as that worked at the Stahl mines.

AUDRAIN COUNTY.

Production, 40,759 tons.

Audrain county is situated on the eastern border of the coal belt of this state. The county is nearly all underlaid with the coal measure formation, and mining is prosecuted at various points in the county. The most extensive mines are located at Farber, Laddonia, Martinsburg and Vandalia, with several small mines at other points. The C. & A. and Wabash Railways running through the center of the coal field furnish good facilities for carrying the product to market. There were 11 mines operated in this county during the past year and 40,759 tons of coal produced, which was sold at the mine for \$1.43 per ton or a total of \$59,607 for the product. Following is a description of each mine as found at date of inspection.

FARBER POSTOFFICE.

Farber Coal Company—C. Peterson, superintendent. Mine located at Farber and has shipping connection with the C. & A. R. R. Shaft 104 feet deep, and operated by steam power. The mine is ventilated by a small fire basket which was giving satisfactory results as plenty of fresh air was found traveling around the face of the workings. The shaft was recurbed and a new boiler put in to take the place of the old one, condemned. The coal is about twenty-eight

inches thick and worked on the longwall plan. An experimental trial was made here to use the movable face track, but proved a failure as the roof was too weak the mine is very practically operated, and the roadways are high, dry and clean. Price paid for mining, seventy cents for screened coal. There were twenty-five and twelve men employed, respectively, at dates of inspection.

LADDONIA POSTOFFICE.

Laddonia Coal Company. Mine located at Laddonia. Shaft fifty-five feet deep; horse power. Coal twenty-six inches thick and worked on the longwall plan. The roof is very soft and the mine is making considerable water which limits the output greatly. The coal is taken away from the mine in wagons and consumed at Laddonia and vicinity; from four to six men employed. There are several small mines operated at Quiver creek in the fall and winter to supply the home demand.

MARTINSBURG POSTOFFICE.

The Krieger Coal Company. Mine located about one-half mile east of Martinsburg and has shipping connection with the Wabash R. R. Shaft 107 feet deep; equipped with steam power for hoisting. Ventilation is furnished by a furnace which is giving very good results. I made two visits to this mine during the past year, first inspection made on the seventh of October and it was found in good condition with the ventilation up to the requirements of the law. I visited the mine again on the twenty-sixth of April, but as it was not in operation no inspection was made. Coal about thirty inches thick, and worked on the longwall plan; pay for mining, seventy cents per ton for screened coal. The cost of operating the mine is largely increased by the amount of water which enters the mine through the roof. From twenty to twenty-five men employed. Thos. Lewis, foreman.

The McGuire mine is located about four miles south of Martinsburg. Shaft twenty-six feet deep; hoisting by horse power. Coal three and one-half feet thick, and worked on the room and pillar plan. The coal is taken away from the mine in wagons and consumed in the surrounding country. From three to six men employed.

BENTON CITY.

The Hoselton mine is located about four miles south of Benton City and is operated by Pharis Cave. Shaft thirty-two feet deep; horse power used for hoisting. Coal four feet thick and worked on

the room and pillar plan; pay for mining seventy-five cents per ton for screened coal. This mine is located on an isolated deposit of coal which seems to extend over a large area of territory and mining could be profitably engaged in here were it not that it is four miles distant from the nearest railroad; having to haul the coal in wagons such distance makes the expense too great to compete with other mines furnishing the same market; much of the output, however, is shipped to local points along the line of the Wabash railroad. From four to ten men employed in winter.

VANDALIA POSTOFFICE.

The Vandalia Coal Company. This company owns and is operating two mines at Vandalia, both have shipping connection with the C. & A. R. R., both have vertical shafts and are each operated by steam power. Shaft No. 1 is located about one-fourth of a mile west of the depot, and is sixty-five feet deep; ventilation is furnished by a furnace with good results. Coal twenty-eight inches thick and worked on the longwall plan. The coal is underlaid with a good fire clay which is taken out, leaving the coal for roof. The clay mine is worked on the room and pillar plan, and requires a large amount of timber to keep it secure. Nearly all the coal produced is consumed at the mine in the manufacture of the clay into bricks and other articles, employment is thus furnished to quite a number of men and boys around the mine and brick works. David Stacy, superintendent.

Mine No. 2 is located one mile west of depot. Shaft seventy-five feet deep; operated by steam power for hoisting. Ventilation is furnished by an eight foot fan, giving good satisfaction. Coal twenty-eight inches thick and worked on the longwall plan, pay for mining seventy cents per ton for clean coal. The coal seam is underlaid with fire clay mining, and overlaid with slate roof which is easily secured by timber, but the mine has been greatly hampered lately by faulty coal. The mine is dry with good high roadways and in good condition. From forty to fifty men employed. Coal chutes have been erected at the mine, and the product is mostly consumed by the railroad company in coaling its engines.

The Standard Coal Company. Mine located at Vandalia. Shaft sixty-two feet deep; horse power used for hoisting. The same vein is worked here as that at the other mines in this locality, and the same method of mining practiced. This mine has no shipping connections, and is only operated during the fall and winter to supply home consumption.

BARTON COUNTY.

Production, 67,844 tons.

Barton county ranked eighth in the annual report of 1898, with an output of 104,000 tons of coal, and she ranks eleventh in this report with an output of 67,844 tons, showing 36,156 tons less than the previous year. We anticipate a large increase in the output of this county during the current year, as the Western Coal Company has already sunk a shaft near Minden and equipped it with first class machinery, and when properly opened out and developed will be the largest producer in the state. Barton county is all underlaid with the coal measure formation, and mining is being prosecuted in every township in the county; but only in the surroundings of Minden is mining done on a large scale. The covering over the coal being shallow makes underground mining impracticable, and the coal is obtained in a number of places after first taking off the overlying strata, or what is called stripping. Twenty-four mines were operated here during the past year. The product was sold at the mines for \$70,863, or an average of \$1.04 per ton. The K. C., Ft. S. & M. and the Mo. P. railways pass through the center of the coal field of this county furnishing good shipping facilities for the product. Following is a description of the larger mines.

BOSTON POSTOFFICE.

The coal seam in the surroundings of Boston is thin and shallow, and all the coal is obtained by stripping. Names of parties who operated mines in the vicinity during the past year, with thickness of coal and all other particulars can be found in the statistical table of Barton county.

LAMAR POSTOFFICE.

The surface vein which is mined at Boston and surroundings extends to the vicinity of Lamar where several small mines are operated in the fall and winter to supply local trade. Particulars found in statistical table.

LIBERAL POSTOFFICE.

There are a large number of small mines operated in the surroundings of Liberal through the fall and winter. The coal in this neighborhood is about two feet in thickness; several of the mines are entered by drifts while two have shaft openings and the others are strip pits. The coal from all the mines in this vicinity is taken away in wagons and shipped to local towns along the line of the railroads running through Liberal. The names of the operators and output of each mine with all other information regarding the mines, will be found in the statistical table of the county in this report.

MINDEN POSTOFFICE.

Joe Shorts is operating a drift and a strip pit west of Minden. Coal, thirty-two inches thick and worked on the room and pillar plan, from three to six men employed.

Sanford Bros. operate a strip pit near Minden shipping the coal over the K. C. Ft. S. & M. R. R. to market.

Wear Coal Company. A. B. Kirkwood, superintendent; J. C. Kirkwood, foreman. Mine is located at Vernon station, and has shipping connection with the K. C. Ft. S. & M. R. R. Shaft forty-five feet deep; and equipped with good machinery for hoisting. The ventilation is furnished by a ten-foot fan, and the ventilative current is divided into four separate divisions. The air is forced down the hoisting shaft, and split at the bottom to the east and west, travels to the face of the main entries where it is split again to the north and south entries and conducted around the workings returning to the upcast; the air from the north side passes over an air crossing. I made a careful inspection of the mine on the seventh of October and found the air deficient at several points caused mainly by the failure to set doors at proper places. Instructions were given to have air-courses cleaned and enlarged, doors set, and other suggestions made for the general benefit of the mine. On the eleventh of May I visited the mine again and made another inspection. I soon found that very little improvement had been made since my former visit. Discovered the aircourses from the first to the fifth north on the east side were nearly closed by reason of falls of slate, and practically speaking there was no current of air passing, while from the fifth to sixth north the air-courses were entirely closed; but there were only a few men found at work in these entries. I immediately notified Mr. Kirkwood of

the condition of the mine, with instructions to have the evils remedied at once, to which he promptly replied that he would give it his immediate and personal attention and comply fully with my instructions. Sometime ago this mine was leased to a party who neglected it and it was nearly ruined. I expect to find it in better condition on my next visit which will be in the very near future. Coal thirty-four inches thick and worked on the room and pillar plan, fifty-six cents per ton is paid for mining during the winter and fifty-two cents during the summer months for unscreened coal. The coal is underlaid with a hard bottom and is overlaid with hard slate roof easily secured with timber. Seventy and eighty-five men were employed, respectively, at dates of inspection. The product is consumed at Kansas City and points north and west.

BATES COUNTY.

Production, 441,983 tons.

Bates county ranks second on the list of the coal producing counties. It is entirely underlaid by the coal measure formation and coal is being mined in various parts of the county. The coal belt of Bates county is apparently inexhaustible, and while large mines have been worked out and abandoned, other larger mines are being developed which will prove as productive as ever. During the year just closed 33 mines were operated in this county, which produced 441,983 tons of coal. This product was sold at the mines for \$403,033, or an average of 90 1-3 cents per ton. In producing this amount of coal an average of 720 men were employed in and around the mines. Powder during the past year cost the miners \$36,300.95, there having been 18,404 kegs consumed. All the coal of this county is taken to market over the Missouri Pacific railroad which passes through the center of the coal field. Three inspections were made of the mines of Bates county during the past year. Following is a description of each mine with a statement as to their location and condition as found at dates of inspection.

AMSTERDAM POSTOFFICE.

John Nickel operates a strip pit at Amsterdam through the fall and winter to supply the home consumption. There are several other mines in the same locality operating on a small scale during the cold season. The coal is three feet thick and of very good quality.

FOSTER POSTOFFICE.

The coal in the surroundings of Foster is like that of Amsterdam, Amoret and Worland, about three feet in thickness with very shallow covering, making underground mining impractical as well as unprofitable.. There are a large number of strip-pits operated in this locality and the coal is obtained at these mines by taking off the overlying surface first and then quarrying the coal. Other information concerning its respective mines will be found in the statistical table of this county.

RICH HILL POSTOFFICE.

Rich Hill is noted for its large and extensive mines, and its valuable coal deposits; it is the great coal center of the southwest and its mining operations are progressing in a very satisfactory manner. An enormous amount of coal is mined here every year within a radius of six miles. The thickness of the coal in the surroundings of Rich Hill varies from three to six feet, and the prices paid for mining previous to the month of June, 1899, was the same as last year, but prices paid for unscreened coal at present are higher. The mines are worked on the double entry room and pillar plan, and the coal is obtained by blasting off the solid.

Bruce & Rees Coal Company. Mine located four miles northwest of Rich Hill, and has a shipping connection with the Missouri Pacific R. R. Mine entered by a slope, and ventilated by a furnace which was giving good results. Mules were formerly used to haul out the coal, but during the past year machinery was put in and the hauling is now done by steam power. Coal three and one-half feet thick and worked on the double entry room and pillar plan. From twenty to thirty-five men employed.

Jas. Gee is now operating a mine on the land of the Rich Hill Coal Company, about two miles north of Rich Hill, having worked out and abandoned the old mine. Mr. Gee had not developed his mine to a great extent at date of my last visit to the mines of Rich Hill, hence no inspection was made.

J. Demair. Mine located four miles northwest of Rich Hill. Drift opening, and ventilation furnished by a furnace, with good results. Coal four and one-half feet thick and worked on the double entry room and pillar plan. From six to ten men employed.

Robert Pearson. Mine located four miles northwest of Rich Hill.

Mine entered by a slope and ventilated by a furnace with good results. Coal four feet thick and worked on the double entry room and pillar plan. From fifteen to twenty-five men employed. The same price is paid for mining at all these mines as that paid by the Rich Hill Coal Company's mines.

Wm. Lowder, is operating a mine four miles northwest of Rich Hill, mine entered by a slope and ventilated by a furnace.. Coal four feet thick and worked on the room and pillar double entry plan. From six to twelve men employed.

Peter Pearson, operates a mine near Rich Hill. Coal five feet thick and worked on the room and pillar plan. The coal is taken away from the mine in wagons and consumed in the surrounding country.

Rich Hill Coal & Mining Company—Maj. R. M. McDowell, general manager, and W. B. Williams, general superintendent. This is the largest coal company in the state. The output of its mines constitutes a very large portion of the coal production of the state for the past year. All of its mines are operated on the double entry room and pillar plan, and the coal is mined by blasting it off the solid. The mines are all well ventilated, and the requirements of the mining law closely observed by the management. All the doors are made of double thickness of lumber and are properly hung, the airways are high, wide, clean and roomy, and a large volume of air can travel through them at a low speed of the current. In fact the mines are practically operated and well managed, and great precaution is practiced at all times to guard against accidents.

Mine No. 15—Alex. McKinnon, foreman. Mine located two miles south of Rich Hill, and has shipping connection with the Missouri Pacific Railroad. Shaft 106 feet deep equipped with first class machinery for hoisting. This is the best equipped, the largest producer, and the most practically operated mine in the state. The mine is ventilated by a fifteen foot fan, which is set on top of the escapement shaft, exhausting the air from the mine. I made the first inspection of the mine on the twentieth of October and found it in good condition. The company having worked out its original territory, bought more coal land adjoining, and I discovered on this visit that new works had been opened out on what is known as the Hill land. I made another inspection on the twenty-fifth of January and found the mine in excellent condition with the ventilation above the requirements of the law, with all the safety appliances in good working order. I visited this mine again on the thirteenth of April, and made another careful and thorough inspection. The fan at this date was running

at a speed of eighty revolutions per minute, and 49,390 cubic feet of air was found circulating through the mine in same length of time; this volume of air was traveling around the mine in four separate currents. One of the currents ventilated the straight east and the pillars on the north side. Another current ventilated the two south and the two southwest entries. The third current ventilated the eleventh, twelfth, thirteenth and fourteenth east entries on the south side, while the fourth current ventilated the fifth, sixth, seventh, eighth, ninth and tenth east entries. The latter current while sufficient in quantity was found rather over loaded with work, and the air was much vitiated with impurities, and on investigation discovered that another aircourse was then in course of construction which as soon as completed would better the ventilation a hundred per cent. In breaking into the new territory, the company had to encounter considerable black damp which had accumulated in the abandoned workings and which had to be passed through to reach the coal; but that difficulty was soon overcome by the management having new aircourses made all around the mine, and shutting off the old workings entirely. This mine is very extensively operated, an electric plant is now in course of construction here to haul out the coal in place of mules which will prove to be a big saving to the company. Gas men are employed to examine the mine thoroughly every morning before any of the employees are permitted to enter. Shot firers are also employed to fire all shots (made through the day) after the miners and others leave the mine. And none but the most practical and careful men are employed for this hazardous and important work. Coal varies from three and one-half to five and one-half feet in thickness. It is underlaid with hard fire clay, and overlaid with a variety of black slate and soapstone. The mine is worked on the double entry room and pillar plan. There were 200, 230 and 260 men and boys employed respectively, at dates of inspection, and thirty-five mules. The equipment of the mine for hoisting and loading is of the most modern pattern and in good working order. The product is shipped over the Missouri Pacific Railroad.

Mine No. 20. James Price, foreman. Mine located six miles northwest of Rich Hill, and has shipping connection with the Missouri Pacific R. R. Shaft eighty-five feet deep; and equipped with first class machinery for hoisting. The mine is ventilated by a twelve foot fan, which is the best constructed, as well as the most efficient ventilating fan in the state. The ventilative current is divided at the bottom of downcast to the north and south, the current going south ventilating

the east and west entries on that side, while the current traveling to the north side ventilates the cross entries in two separate splits, after which they unite with the other current and escape out through old No. 13, where an underground connection is made. I made three inspections of this mine during the past year. First inspection was made on the nineteenth of October, when it was found in excellent condition with the air current double the amount required by law. February : I visited the mine again, and accompanied by a few of the oldest and most experienced miners of the Rich Hill district, made a careful and a thorough inspection of same. An explosion having occurred here on the night of the first causing the death of the two shot firers. (Full particulars of this accident, result of investigation, with all other information concerning same will be found in an article on explosion embodied in this report.) I made another inspection on the eighth of April, and found the mine in first class condition. The airways are large and roomy, and while the fan was running at a very low rate of speed, it furnished double the amount of air required to properly ventilate the mine. The two mines directly under the care and supervision of Mr. Jas. Price (Nos. 10 and 20) have been very unfortunate in the number of casualties and must in justice state that I do not consider Mr. Price responsible for any of the many accidents that have occurred at the above mentioned mines by reason of and neglect on his part. Mr. Price is practical and attentive to his business, I invariably find him at his post of duty, carefully looking after those under his care, and always find his mine in good condition, with all doors properly set, at proper places and at the right time, abandoned cross-cuts are found securely closed, and the ventilative current found rushing past the face of the workings; entries are found well secured by double timber, and I must say that accidents that have occurred at these mines are not attributable to any neglect of the foreman or coal company. Coal from three to four feet thick and worked on the double entry room and pillar plan. From eighty to ninety men employed.

ROCKVILLE POSTOFFICE.

John A. Ford operates a strip mine northwest of Rockville. The coal is from five to six feet in thickness, and of good quality. It is taken away from the mine in wagons and consumed in the surrounding country.

D. D. Peeler is operating a strip mine in the same locality on the same coal seam. This is a continuation of the coal belt that runs

through Rich Hill, and a large amount of coal could be put on the market from these mines, and at a profit if there was better shipping facilities. The output is now limited to local trade.

WORLAND POSTOFFICE.

The coal in the vicinity of Worland is about three feet in thickness with a shallow covering, making underground mining impracticable. A large amount of coal is taken out at strip-pits and when the covering gets too thick to take it off, drifts are then driven from the bottom of the strip-pit. The names of all parties operating in this vicinity will be found in the statistical table of this county, with the output of each mine, and other information relative to same.

BOONE COUNTY.

Production, 29,665 tons.

Boone county is situated on the margin of the coal measure formation, and coal is mined in nearly every township in the county, but only in a small way to supply the home demand. The same seam of coal is mined here as that so extensively worked in Macon and Randolph counties. Fifteen mines were operated in this county during the past year, producing 29,665 tons of coal, which was sold for \$39,634, or \$1.33 per ton. Following is a description of the location and condition of each mine as found at dates of inspection:

COLUMBIA POSTOFFICE.

Blackfoot Coal Company—Jas. Hubbard, foreman. Mine located five miles northwest of Columbia, on what is known as the gravel road. Shaft 120 feet deep; operated by horse power. Ventilation is furnished by a furnace with very fair results. The coal is forty-four inches thick and worked on the double entry room and pillar plan; paying seventy-five cents per ton for mining and wheeling the coal to the bottom and putting it on the cage. This could be made an extensive mine if it had railroad connection to ship the product to other markets; but being located five miles from a railroad, it is limited in its output, and confined to local demand. Employment is given to about eighteen men in winter and five in summer. Coal consumed at Columbia and surroundings.

Carter Bros. Mine located four miles northwest of Columbia on the gravel road. Shaft eighty feet deep; equipped with horse power

apparatus for hoisting. Ventilation is furnished by the aid of a furnace with satisfactory results. Coal forty-four inches in thickness and worked on the room and pillar plan, seventy-five cents per ton is paid for mining and wheeling. The coal is overlaid by good hard slate and is easily secured by timber. This could be made a productive mine if it had shipping facilities, but located away from any railroad, its output is confined to home trade. The coal is taken away from the mine in wagons and consumed at Columbia and vicinity. From fifteen to twenty men are employed in winter, and about six in summer. E. T. Hubbard, foreman.

Columbia Coal Company. Mine located at Henry station, and has shipping connection with the Columbia branch of the Wabash R. R. Shaft 112 feet deep; operated by steam power. Ventilation is furnished by a fire basket at the foot of the upcast which is giving very fair results. Very little mining has been done here during the past year. After the mine had been idle for a month a party of miners started it up again, but not having the capital to operate it properly, failed, and it is idle again at this writing.

Scott Gordon. Mine located one mile east of Columbia. Shaft fifty-five feet deep; horse power used for hoisting. Ventilation is produced by a furnace with very fair results. This is a new mine opened out during the year, and at date of inspection six men were employed. An escapement shaft was in course of construction at that date; it is now down and in use. Coal thirty inches thick and worked on the double entry room and pillar plan, pay for mining seventy-five cents per ton. The coal is consumed at the waterworks and surrounding country.

HARRISBURG POSTOFFICE.

A large amount of coal is taken out yearly at Harrisburg by several parties who own coal land, but the most of it is strip coal. The coal seam running through this place is a continuation of the seam that is so extensively mined in Randolph county. It is about four feet thick and of good quality, and extensive mines could be operated here if there were better shipping facilities to take the coal to a market. The names and output of every mine, with other information, will be found in the statistical table of this county. There are several mines operated at Centralia, Rucker and other places throughout the county, but only in small way to supply the local trade.

CALDWELL COUNTY.

Production, 28,000 tons.

Caldwell Coal Company—E. B. Hayden, president and manager. Mine located two miles east of Hamilton, and connected with the Hannibal & St. Joe R. R. by a switch. Shaft 507 feet deep and equipped with good machinery for hoisting. The ventilation is furnished by a ten foot fan, with satisfactory results. This is the only mine in the county now in operation, and has the distinction of being the deepest mine in the state. I visited the mine on the seventeenth of November, and found the fan house burned down and the men called out of the mine. I could not make an inspection. December 21, I visited the mine again and made a thorough and careful inspection, and found it in very fair condition with the ventilative current circulating around satisfactorily. I visited the mine again on the seventeenth of June and found it satisfactory at most points. Occasionally places were found in the air-courses so contracted as to make the area too small for a sufficient quantity of air to pass through for proper ventilation; this is due to the constant settling of the roof, but is soon remedied when it occurs. Ladders are placed in the escape shaft for the men to climb out in case of accident. The coal is about eighteen inches thick and worked on the longwall plan. It is underlaid with fire clay mining, and the roof varies in the character of its formation with either shale, soapstone or sandstone, either makes very good roof for long-wall work and it is easily secured with timber. The coal seam runs very regular, and is of excellent quality. From eighty to ninety men employed. Pay for mining, \$1 per ton in winter, and eighty-seven and one-half cents in summer.

CALLAWAY COUNTY.

Production, 22,365 tons.

Callaway county is situated on the eastern margin of the coal formation and coal has been found and mined in nearly every township in the county. The same vein is worked here as that so extensively mined in Macon and Randolph counties, but runs more irregular here than the last named counties and crops out in low places. The principal mine, and the only one in the county having shipping facilities, is located at Fulton. Following is a description and location of the mines operated in this county:

FULTON POSTOFFICE.

Wm. Castle is operating a mine near Fulton, drift opening, coal twenty-six inches thick and worked on the longwall plan. The product is consumed at Fulton and vicinity.

John A. King is operating a mine south of Fulton on the Jefferson City Road. Coal three and one-half feet thick and worked on the room and pillar plan, mine making considerable water, and we are informed that it is now abandoned.

John Harris. Mine located south of Fulton. Shaft forty feet deep; horse power used for hoisting. Ventilation is furnished by a furnace with very fair results. Coal twenty-six inches thick and worked on the longwall plan. The coal is taken away in wagons and consumed at Fulton and surroundings.

The Carbon mine is operated by J. W. Simmons. Mine entered by drift and ventilated by a furnace. Coal twenty-six inches thick and worked on the longwall plan. Coal consumed in the surrounding country.

James Smith is operating a drift mine in the same locality, on the same seam and on the same method. Employment is given to ten or twelve men in winter and four in summer. Eighty-seven and one-half cents per ton is paid for mining. The coal is hauled away in wagons from the mine and consumed at Fulton.

There are others in the surroundings of Fulton and at other points operating mines through the winter season on a small scale which we could not afford the time to visit, and as the mines are only operated during a few months of the year, they are liable to be closed down when we get to them.

Fulton Fire Brick & Mining Company—L. U. Nickell, manager; H. Harris, foreman. Mine located two miles south of Fulton and has shipping connection with the Mexico & Cedar City branch of the C. & A. R. R. Shaft 100 feet deep; and operated by steam power. Ventilation is produced by a fan, but owing to small and contracted airways defects in the ventilation was found in several parts of the mine at both visits of inspection. The roof over the coal is soft and friable and often breaks down in the entries as well as the aircourses and also along the coal face, thus preventing the free and uninterrupted progress of the air current and causing the miners to suffer for want of air; but the management is using every effort to furnish the required amount of air in the mine. Coal thirty-three inches thick and

worked on the longwall plan. Seventy-five cents per ton is paid for mining. Thirty feet below the coal a fire clay seam is mined on the room and pillar plan and both the coal and clay are hoisted through the same shaft. Employment is thus given to about forty men. The company consumes a large amount of its coal at the mine in the manufacture of the clay into brick, sewer pipes and locomotive blocks.

CARROLL COUNTY.

Production, 2,397 tons.

Very little mining has thus far been carried on in Carroll county, notwithstanding the entire county is underlaid by the coal measure formation. The mines which are operated in this county are worked on a small scale to supply home trade. The top seam is mined here which is only about twenty inches in thickness, and quite a number of the mines are strip-pits. Other information concerning the names and output will be found in the statistical table of Carroll county in this report.

CASS COUNTY.

Production, 1,321.

Creighton Coal Company. Mine located at Creighton. Shaft 160 feet deep; and equipped with steam power. This is the only mine in this county and while it has been opened about four years, very little has been done here. It is situated about half a mile from the railroad and the coal is hauled from the mine in wagons; but at date of my last visit, May 9, I found the company building a tramroad from the mine to the railroad switch which when ready will increase the output. Coal will average about thirty-two inches in thickness and is worked on the double entry room and pillar plan. Ventilation is furnished by a small fan, which is set at one end of main shaft, exhausting through an air chamber partitioned off hoisting shaft, but an escapement shaft is now in course of construction, and as soon as finished the fan will be removed. Six men employed.

CEDAR COUNTY.

Production, 2,116 tons.

There are several parties operating mines on a small scale in the surroundings of El Dorado Springs, Filley, Jerico, Lebeck and other

parts of the county. Cedar county contains only a small portion of the coal measures formation, the coal bearing rock being confined to the western portion of the county. The coal is found in local deposits in the hills and the mines are entered by drifts and slopes. It varies in thickness from twenty-four to thirty inches; is worked on the room and pillar plan, and a dollar a ton is paid for mining. The output of the mines is small, as they are only operated a few months in winter to supply local trade. Names of the parties who have been operating these mines during the past year, and all other information will be found in the table of statistics in this report.

CHARITON COUNTY.

Production, 4,517 tons.

Chariton county is entirely underlain by the coal measure formation, but as yet very little mining is being done within its limits. A few local mines are operated in the neighborhood of Dalton, Indian Grove, Keytesville, Newcomer and Salisbury. The coal at these mines is about twenty inches thick and of good quality. The mines are only operated in the fall and winter, and the coal is consumed in the vicinity of the mines. Names, output of the mines and other information concerning them will be found in the table of Chariton county.

CLAY COUNTY.

Production, 8,000 tons.

Missouri City Coal Company. Mine located at Missouri City, one-fourth of a mile west of the depot. Shaft 154 feet deep; and equipped with good machinery for hoisting. Ventilation is furnished by a ten foot fan, and the mine is well ventilated. I inspected the mine on the fifteenth of October, and found it in good condition with twenty-six men employed. May 19 I visited the mine again and found it idle, and on inquiry was informed that the company had failed to pay its miners. This was no surprise to me, as some members of the company were connected with the Wild Cat Company which has been operating mines in Randolph county, where it treated its employees with the same kind of medicine. I can not command language severe enough to use on parties who wilfully rob a poor miner of his hard earned money. Coal twenty inches thick and worked on the longwall plan. It is underlain with good fire clay mining and overlaid with

excellent rock roof well adapted for that system of mining. It is the same seam as that so extensively mined in Ray county. The product is shipped over the Wabash railroad to Kansas City and points west.

Since I have been inspecting the mines of this state, I have discovered some so-called companies operating mines, that judging from their acts, never hoped by reason of their ability and knowledge of the business to operate the mines for profit in a legitimate way, but trusted in their ability to hoodwink, cheat and steal from the miner. It is high time that some legislation should be enacted that would put an end to such rascality.

COLE COUNTY.

Production, 8,600 tons.

The coal mined in Cole county is found in pockets or isolated coal deposits. There are three mines in operation in Cole county at Elston station.

Kauffman & Robben are operating a mine two miles south of Elston. Shaft sixty-eight feet deep; operated by horse power. Coal six feet thick. Employment is given to six men in winter and two in summer.

Knernscheld & Son. Mine located one and one-half miles south of Elston. Shaft 102 feet deep; equipped with horse power apparatus for hoisting. The coal deposit at this mine is sixty feet thick of the cannel and bituminous variety; but only a portion of it is worked. It is taken away from the mine in wagons, loaded on cars at Elston switch and shipped over the Missouri Pacific railroad to local towns.

Heutger & Son. This concern operates a mine on one of these isolated coal deposits. Mine entered through a vertical shaft 107 feet deep; using horse power for hoisting. The coal is fifty feet thick and is worked on the room and pillar plan. Some of the coal is left above for roof while the mine is driven to the limit of the pocket and then that which is left is taken down when coming back again. From four to six men employed.

DADE COUNTY.

Production, 4,930 tons.

Mining has been carried on in Dade county for a great number of years, but only on a small scale to supply home trade. The coal measures of this county occur only in the northwestern corner, where they

are confined almost exclusively to one or two townships. The coal is found in the hill-tops and ridges, and the mines are entered by drifts. It will average about thirty-two inches in thickness and is of excellent quality. The mines are located twelve miles away from a railroad, and the coal is taken away in wagons, and consumed at Greenfield, Golden City, Lockwood and the surrounding country. Names of operators and output of their mines during the past year with other information concerning same will be found in the statistical table on Dade county in this report.

GRUNDY COUNTY.

Production, 39,633 tons.

Mining is prosecuted only at two points in Grundy county, viz., at Galt on the eastern border of the county, and at Trenton. While these mines are fifteen miles apart, they are both working the same seam of coal.

GALT POSTOFFICE.

Duff & Carpenter Coal Company. Mine located on the west side of Galt. Shaft 210 feet deep; and hoisting by steam power. Coal eighteen inches thick and worked on the longwall plan. The seam of coal runs irregular in this mine, and can not be operated profitably and compete with other mines, consequently its output is limited and confined to local trade.

TRENTON POSTOFFICE.

Grundy County Coal Company—Robert Aladise, superintendent. Mine located half mile southeast of Trenton, connected with the Chicago, Rock Island & Pacific R. R. by a switch. Shaft 170 feet deep and equipped with first class machinery for hoisting. Ventilation is furnished by a ten foot fan, with satisfactory results. I made two inspections of this mine during the past year. First inspection was made on the sixteenth of August, 1898, and I discovered that the escape shaft had been completed and the fan removed and set on top of it, and a very much stronger volume of air was found travelling around the mine. Test of the air was taken at the bottom of the downcast shaft, and 14,580 cubic feet was found passing every minute. This volume was forced around the mine in two separate currents at this date, but preparations were then being made to build an overcast on the east side which would make another split. The ventilation was

found greatly improved since my former visit. I visited the mine again on the twenty-second of April and found it in very fair condition with the ventilation up to the requirements of the law, with all the safety appliances in good working order. The coal is about eighteen inches thick and worked on the longwall plan, and mining paid for at the rate of \$1 per ton. There were about 130 men and boys employed at each date of inspection. The coal is of excellent quality for steam and all other purposes, and the product is consumed by the railroad company and the city of Trenton.

HENRY COUNTY.

Production, 81,373 tons.

Henry county may be classed as one of the large coal producing counties of the state. The county is all underlaid with the coal measure formation, and mining is prosecuted in every township of the county. The larger mines having been gradually worked out and abandoned, the output has also gradually decreased from year to year. The covering over the coal in many parts of the county is thin and of such nature as to make underground mining impracticable while the strip-pits having been worked until the overlying material is of such thickness as to make them too expensive to work; they too, are being abandoned, with not half of the coal taken out. Following is a description of each mine now in operation, with a statement as to their location and condition as found at dates of inspection.

BROWNINGTON POSTOFFICE.

Cooper Creek Coal Company. Mine located south of Brownington, and has shipping connection with the Kansas City & Osceola R. R. Shaft forty-two feet deep; hoisting by horse power. Ventilation is produced by a furnace with very fair results. Coal three feet thick and worked on the room and pillar plan. Pay for mining ninety cents per ton in winter, and eighty cents in summer. From fifteen to twenty-five men employed.

J. Thompson & Bro. Mine located between Brownington and Deepwater, and connected with the Bailey R. R. by a spur switch. Shaft forty feet deep; hoisting by steam power and ventilated by a furnace. Coal three feet thick and worked on the double entry room and pillar plan. This mine makes considerable water, having been sunk between strip-pits. From twenty to thirty men employed.

Blanchard & Thompson Coal Company. Mine located south of Brownington, and has shipping connection with the Bailey R.R. Shaft

forty-five feet deep; hoisting by horse power. The same seam of coal is mined here as at other mines in this locality. Worked on the the same method and same price paid for mining. From fifteen to twenty men employed.

The Rustler mine is operated by S. Mantle & Son. Shaft forty-five feet deep; horse power is used for hoisting, and furnace for ventilating the mine. Coal three feet thick and worked on the room and pillar plan, paying ninety cents per ton for mining in winter and eighty cents in summer. The coal is taken away from the mine in wagons, loaded on cars at Easton switch and shipped to market over the K. C. Ft. S. & M. R. R.

CLINTON POSTOFFICE.

The Stockton Bros., are operating a mine on Judge Avery's land, which is located about three miles southwest of Clinton. Shaft thirty-four feet deep; horse power. Coal about two feet thick, worked on the room and pillar plan. Coal hauled to Clinton where it is consumed.

Daily Coal Company. Mine located east of Clinton and is entered by a vertical shaft, and ventilated by a small furnace. The coal is hauled in wagons and consumed at Clinton.

George W. Storey is operating a mine east of Clinton to supply local trade.

John Watkins is operating a mine on the F. O. Owen's land which is located about two miles east of the city limits. Shaft thirty feet deep; hoisting by horse power. Coal two feet thick; worked on the room and pillar plan and paying \$1 per ton for mining. The coal is hauled away in wagons from the mine and consumed at Clinton.

Wm. England operates a mine southeast of Clinton in fall and winter to supply local trade.

The Jordan mine is now operated by the Sheldon Coal Company. This mine is located five miles south of Clinton, at North station and is connected with K. C. Ft. S. & M. R. R. by a spur switch. Shaft fifty-five feet deep; operated by horse power. Coal about thirty inches thick and worked on the double entry room and pillar plan, paying ninety cents per ton for mining. This seam of coal known here as Jordan coal lies in basins or pockets, and runs very irregularly, and often runs out altogether; while this mine has not been operated over two years it is about worked out, the coal having the appearance of running out all around, makes mining very uncertain here. From twenty to forty men have been employed during the past year. The

coal which is of excellent quality finds ready market when once introduced.

W. E. Flesher is operating a mine east of Clinton. Mine entered by a slope and ventilated by a furnace. Coal consumed at Clinton.

CALHOUN POSTOFFICE.

Thos. Neal is operating a mine on the land of Mrs. E. N. Parks, near Calhoun. Shaft thirty-five feet deep; using horse power for hoisting. Coal three and one-half feet thick. Mine only operated in the fall and winter, and the coal consumed at home.

DEEPWATER POSTOFFICE.

John Hurst is operating a mine southeast of Deepwater. Shaft thirty feet deep; horse power. Coal about three feet in thickness and worked on the room and pillar plan. The coal is hauled away in wagons, loaded on cars at Easton switch, and shipped to market over the K. C. Ft. S. & M. R. R. Employment is given to fifteen men.

Wm. Rees, Jr., operates a mine in the Brush near Cooper creek. The same seam of coal is mined as that at the other mines in this locality also the same method of mining. The coal is taken away in wagons and shipped over the K. C. Ft. S. & M. R. R. From ten to fifteen men employed.

Wm. Rees, Sr., is also operating a mine in the same locality working the same seam, paying the same price for mining, and shipping the product over the same railroad.

The Deepwater Tile & Mining Company. Sam'l Smith, foreman. Mine located at Deepwater. It is entered by a slope and ventilated by a furnace. Machinery is used to haul out the coal which is all consumed at the mine by the company in the manufacture of tiling, sewer pipe and other articles. The coal at this mine is about three feet in thickness and of excellent quality. The covering is very shallow and the mine is making considerable water which is taken out by steam pump. From ten to fifteen men employed.

Hurst & McFadden Coal Company. Mine located southeast of Deepwater. Shaft thirty-five feet deep; horse power. Coal three feet thick, taken away in wagons, loaded on cars and shipped over K. C. Ft. S. & M. R. R.

There are several other parties operating mines in the surroundings of Brownington and Deepwater on a small scale during the fall and winter to supply local trade.

LEWIS POSTOFFICE.

Tebo Coal Company—John Bowen, superintendent. Mine located two and one-half miles west of Lewis and has shipping connection with the M. K. & T. R. R. Mine entered by a slope, and ventilated by a furnace with satisfactory results. The coal is about twenty-eight inches in thickness and worked on the longwall plan, paying sixty cents per ton for mining. The mine is located one-fourth of a mile from the railroad, and an elevated tramway has been built from the mine to the tipple and steam power is used to haul out the product. The covering over the coal is shallow and the mine is making considerable water which is taken out by steam pump. The roof is soft and friable and hard to keep secured with the present method of mining. The railroad company consumes the entire product which is taken out of the chutes erected at the mine. About thirty men find steady employment the year round.

Co-operative Coal Company. Mine located one-half mile north west of Lewis, and connected with the M. K. & T. R. R. by a spur switch. Shaft seventy-five feet deep and equipped with steam power for hoisting. Ventilation is furnished by an eight foot fan, which exhausts through an air chamber partitioned off the end of hoisting shaft. This mine had been shut down for about two years, and was cleaned up and started early this spring, and at date of my last visit, the eighth of May, was still in bad condition and required considerable more cleaning. The aircourses were closed all around and the company was at work opening them out. The coal is about twenty-eight inches thick and worked on the longwall plan. Twenty men are employed.

There are several mines operated during the fall and winter at Garland, Piper, Montrose, Lucas and Sparrow, but their output is small, supplying the local trade.

WINDSOR POSTOFFICE.

The Beeby mine is operated by W. E. Hughes. Mine located two miles south of Windsor. Shaft twenty-four feet deep; horse power, Coal four and one-half feet thick, and of very fine quality. Mine only operated in fall and winter, and the product consumed at Windsor and vicinity.

L. M. Beaman is operating a mine on the land of J. W. Miller. This mine is located about six miles north of Windsor. Shaft thirty-

five feet deep; hoisting by horse power. This is a local deposit of coal and extends under a large portion of territory. This mine could be made more productive if it had better facilities to ship the coal to a market, but being located six miles from a railroad the output is confined to the local demand.. The coal is taken away in wagons and consumed at Windsor and surroundings.

The Hines mine is located in the same locality as the Miller mine, and working the same coal deposit, but the coal is not so thick here as at the latter mine. The coal is of good quality, overlaid by hard slate roof, easily secured by timbering. In fact very little timber is used. From four to eight men employed.

The Kinsman Bros. mine is now operated by C. W. Field. The coal is three and one-half feet thick and is obtained by stripping. It is hauled away in wagons and consumed in the surrounding country.

JACKSON COUNTY.

Production, 25,125 tons.

Brush Creek Coal Company—Wm. Main, superintendent. Mine located two miles southeast of the city limits of Kansas City, and is the only mine in the county. The shaft is sunk to the lower vein which is 400 feet below the surface, but the seam that is being worked is eighty feet above, or 320 feet from the surface. The mine is equipped with first class machinery; and ventilation is produced in a satisfactory manner by a ten foot ventilating fan. The air current enters the mine through the hoisting shaft, and travels the north and south eneries to their terminus, where it splits again to the east and west, but enough air is allowed to travel each cross-entry to keep it clear of gas. This being a very gaseous mine, it requires and receives the careful and constant care and attention of the mine inspector. I made four inspections of the mine during the past year, viz.. September 14, January 10, March 11, and May 10, and I an pleased to state that at each inspection I found the mine in good condition with the ventilation above the requirements of the law. Double doors have been placed in all entries where a complete check of the air was necessary. Coal is about eighteen inches in thickness, is overlaid by a hard slate roof well adapted for the longwall method of mining which is in use here. The gas escapes from the roof at every break and whenever a fall of the roof occurs at the face of the workings, it also accumulates in all high places out of reach of the air current filling all such space very quickly and so remains until the current of air is

directed against it. Every explosion which has occurred in this mine can be traced directly to the negligence or ignorance of the parties whose duty it was to watch carefully these dangerous places mentioned. I am pleased to state the year just closed has been the most successful since the mine has been in operation, there is not one accident recorded against the mine for the last year. The coal is of very fine quality and finds a ready market at Kansas City and its surroundings. From seventy to one hundred men are employed, and mining is paid for at the rate of ninety cents per ton in winter and eighty-seven and one-half cents in summer.

JOHNSON COUNTY.

Production, 4,710 tons.

Johnson county though underlaid entirely by the coal bearing rocks, is at present one of the small coal producing counties of the state. The mines are small and only operated during the winter season to supply local demand. A little over thirty years ago extensive mines were operated at Clear Fork, Carbon Hill and Montserrat, but owing to the inferior quality of the coal, they were all abandoned before one-tenth of the coal was worked out. There are a number of small mines in the vicinity of Dunksburg operated by different parties to supply home trade. The coal at these mines is about thirty inches thick and of good quality. There are quite a number of mines operating at Bristle Ridge, four miles south of Montserrat, the coal from these mines is hauled in wagons, loaded on cars at Montserrat and shipped to market over the Mo. P. R. R. This coal is of extra good quality for all purposes, and commands a good price in the market. Several mines are operated at Clear Fork, Carbon Hill and Montserrat, but only in the fall and winter. Mr. Thomas Boyd is now opening a new mine about half way between Warrensburg and Centerview on the line of the Missouri Pacific Railroad which will be reported upon fully in the next report. Ed. Hanna is also operating a mine four miles north of Montserrat on the bank of Clear Fork Creek, the coal is hauled in wagons to Montserrat from which place it is shipped over the Mo. P. R. R. The names and output of every mine, with other information, will be found in the statistical table of Johnson county in this report.

LAFAYETTE COUNTY.

Production, 392,068 tons.

Lafayette county is one of the principal coal producing counties of the state, it is the oldest as well as one of the largest producers and is exceeded only by Bates and Macon counties. The coal mined within her borders is a small seam as compared with some of the coal seams in other parts of the state, yet the quality of the coal, the nature of the roof, the economic mode of working and the short haul to market form a combination of advantages which enables the operators of this county to place their coal on the market and compete with coal companies in other parts of the state where a thicker vein of coal is mined. The same seam of coal is mined throughout the county with the exception of that at Waverly where a four foot vein is mined, and which will in the near future prove one of the best coal fields in the state. During the year ending June 30, 1899, there were 48 mines in operation which produced 392,068 tons of coal, valued at \$544,179 for the product. In producing this amount of coal 1,495 persons were employed in and about the mines in winter, and 752 in summer. The Missouri Pacific and Chicago & Alton Railways passing through the center of the coal field furnish excellent shipping facilities. Two inspections were made of all the principal mines of this county during the past year, and all were found in excellent condition at dates of each inspection. Following is a description of each mine with a statement as to their location and condition as found at dates of my visits:

ALMA POSTOFFICE.

Henry Dieckhoff is operating a mine near Alma. Shaft twenty feet deep; horse power. Coal eighteen inches thick and worked on the longwall plan, mine only operated in fall and winter to supply local trade.

M. W. Summers operates a mine in same locality on the same seam of coal and method of mining. Mine entered by drift and ventilated by furnace. Coal consumed in the surroundings of Alma.

AULLVILLE POSTOFFICE.

The Osborn mine is located at Aullville and operated by E. M. Packson. Coal eighteen inches thick, mine operated to supply local trade.

BATES CITY POSTOFFICE.

Thos. Perry is operating a drift mine at Bates City in fall and winter to supply local trade.

CONCORDIA POSTOFFICE.

Henry Bartels is operating a mine on the Steinman property. Shaft twenty-five feet deep; horse power used for hoisting. Ventilation furnished by a furnace. Coal taken away in wagon and consumed at Concordia and surroundings.

Peter Muller operates a mine west of Concordia. Mine entered by a drift, and the coal is consumed in the surroundings of Concordia.

A. F. Kressee. Mine located near Concordia. Shaft twenty feet deep; horse power. Coal eighteen inches thick and worked on the longwall plan. Mine only operated in fall and winter. The coal is consumed at Concordia.

The Brackman mine is operated by M. T. Kelley. This mine is located southwest of Concordia. Shaft fifty-four feet deep; horse power. The same seam of coal is mined here as that of the other mines in the vicinity, and the same method of mining. Mine operated to supply local trade. There are other mines in this locality operating on a small scale in fall and winter, which we had no time to visit. The mining law only requires inspection of mines employing five or more men. Yet since I assumed the duties of Mine Inspector of this state, I have made every effort in my power to visit every mine in the state and to look carefully after the safety of every miner working therein.

CORDER POSTOFFICE.

Corder Coal Company—H. G. Smith, superintendent and manager. Mine located half mile west of Corder, and has shipping connection with the C. & A. R. R. by a spur switch. Shaft eighty feet deep. Coal is hoisted by horse power. Ventilation is furnished by a furnace built on the surface, which is a method for ventilating as old as coal mining itself and abandoned long since by all practical mine men. It is so strange that with all the modern improvements and the advantages experienced in the use of the same, to find men who will persist in the employment of such crude, out of date and impracticable methods for ventilating mines. As we have heretofore stated in a former report, the furnace should always be located down

in the mine to serve practical purposes. The effect of a furnace when placed at the bottom of the shaft is to strengthen the natural current by imparting additional heat to the upcast column of air; it is most effective in deep mines as its power depends upon the amount of air to which its heat can be communicated, and the longer the column of heated air in the upcast shaft, in that proportion is the velocity of the ventilating current increased, as these conditions cause an additional length to the hot air column, consequently a brisker ventilation is obtained. The furnace should always be built at the bottom of the shaft, and there is no argument that I have ever heard to the contrary, worthy of consideration, when compared with the advantages offered above, and no mine of any extent can be satisfactorily ventilated when the furnace is set on top. I consider a furnace out of date, place it where you may in the mine, with the modern improvement in mine ventilation before us; they should be replaced by fans, which I consider the very salvation of the miner. I visited this mine on the fifteenth of September, 1898, and found the ventilation very fair and the mine otherwise in good condition. It has an underground connection with old mine No. 1, where the air comes in, which makes No. 2 the upcast. Old No. 1 is also used as an escapement shaft in case of an accident to hoisting shaft. I visited the mine again on the sixth of April, but as it was not in operation no inspection was made. Coal eighteen inches thick and worked on the longwall plan with the movable face track. Mining is paid for at the rate of \$1 per ton in winter and eighty-seven and one-half cents in summer. About sixty men employed.

Diamond Coal Company. Mine located at Corder. Shaft fifty-eight feet deep; and operated by horse power. This is a new mine sunk and opened out during the spring of 1898. An escapement shaft has also been sunk, and a ladder built for a traveling way for the men in case of an accident. The same seam of coal is worked here as that mined at other mines in this locality; the same method of mining, and same price paid for mining. The mine has a shipping connection with the Chicago & Alton Railroad, and the product is taken to Kansas City where it is consumed.

The Daisy Hill mine is operated by W. H. Bell. Mine located two miles south of Corder. Shaft twenty-five feet deep; horse power. Mine only operated during fall and winter to supply the local trade.

J. H. De Bolt is operating a mine on his land between Corder and Higginsville, and selling the coal to his neighbors.

The Klondyke mine is located about two miles north of Corder. This is also a new mine sunk and opened during last spring. It is

operated on the same vein of coal as the other mines in the surroundings of Corder with other conditions alike. Mine operated to supply local demand.

The Geisendorfer mine is located south of Corder and operated by its owner. The mine is entered by a drift and operated to supply local trade.

W. P. Morgan. Mine located southwest of Corder. It is entered by a drift and ventilated by a small furnace. Operated in fall and winter to supply local trade.

The Leffman mine is located west of Corder and operated in fall and winter only. All the local mines as well as the commercial ones, are working the same vein of coal. The roof over the coal being of a hard lime rock, stands so well during a suspension of work that the mine does not suffer damage while remaining idle.

Salt Fork Coal Company. Mine located one-half mile east of Corder, and has shipping connection with the Chicago & Alton R. R. Shaft forty-five feet deep; equipped with horse power for hoisting. Ventilation is furnished by a furnace with very poor results. I made the first inspection of this mine on the fifteenth of September, 1898, and as on former inspection found the ventilative current weak and sluggish all over the mine. The furnace as usual failing to act properly caused the smoke to back up to where the men were at work, after a while it would reverse itself and act all right. The cause of this is attributable to the small area of the upcast, and the want of a higher elevation of the smoke stack for in its present condition when the wind changes in certain directions it blows down the stack. On the sixth of April, I made another inspection and found the ventilation better, and the mine in very fair condition. Coal eighteen inches thick and worked on the longwall plan, using the movable face track. Considerable faulty coal is encountered in this mine which lets in a large amount of water through the slips causing a great expense in getting rid of it. Mining is paid for at the rate of eighty-seven and one-half cents per ton in winter, and seventy-five cents in summer. About fifty men employed.

GREENTON POSTOFFICE.

Harry St. Clair is operating a mine on the land of Joseph Armstrong. Shaft thirty-four feet deep; hoisting by horse power. Coal sixteen inches thick, and operated during the fall and winter to supply local demand.

Wesley Rowland operated a mine last year on the Chamberlain land. Mine entered by a drift and ventilated by a small furnace and running during the cold weather to supply a home demand.

HIGGINSVILLE POSTOFFICE.

Farmers' Coal Company—Thos. Thomas, superintendent. This company owns and is operating two mines near Higginsville. Both mines are located on the Rocky Branch R. R., and have shipping connection with the Chicago & Alton and the Missouri Pacific Railways. Both are working the same coal seam, and are under the same management. Mine No. 1 is located about two miles southwest of Higginsville. Shaft thirty-eight feet deep; operated by horse power. Ventilation is furnished by a furnace with satisfactory results. Coal eighteen inches thick and worked on the longwall plan, using the movable face track, mining is paid for at the rate of eighty-seven and one-half cents per ton in winter and seventy-five cents in summer. From forty to fifty men employed. The product is consumed at Kansas City and points west.

Mine No. 2 is located three-fourths of a mile south of No. 1. It has a shaft opening, and hoisting has been done by horse power, but we are informed that machinery is now used for hoisting. An electric plant has also been put in at this mine to undermine the coal. Ventilation is furnished by a furnace, and the mine is well ventilated. The same system of mining is used here as at No. 1 and other conditions are the same except that machines now do the undermining. A block of slate, ten inches thick comes down with the coal which is readily used to build pack walls to support the roof. The product is shipped to Kansas City where it finds a ready market, as the coal from these two mines is the best in the county. From fifty to sixty men employed.

The Haygood mine is operated by the Gunn Bros. It is a shaft twenty-five feet deep; hoisting by a horse. Thickness of coal, mode of working and price paid for mining is the same as at other mines in this locality. It has a shipping connection with the Chicago & Alton and Missouri Pacific Railways. From ten to fifteen men employed during winter months.

Dennis & Grim, operate a mine southeast of Higginsville. Mine entered by a slope and ventilated by a furnace with very good results. Coal eighteen inches thick and worked on the longwall plan. This mine is about two miles from a railroad, considerable of the coal is hauled in wagons, loaded on cars and shipped over the Missouri Pacific to market, but a large amount is furnished to the local trade.

The John R. Longest mine was operated during the past year

by J. A. Stephenson. Mine entered by a drift and ventilated by furnace, and operated to supply local trade.

Bonanza Coal Company—Wm. Brandaw, superintendent. Mine located two miles east of Higginsville, and has shipping connection with the C. & A. R. R. Shaft seventy feet deep; hoisting by horse power. The mine is ventilated by a furnace with satisfactory results. I made the first inspection of this mine on the thirtieth of September, 1898, and found it in good condition. May 31, 1899, I visited the mine again and found the ventilation satisfactory with the mine otherwise in good condition. I discovered on this visit a traction gasoline locomotive engine working in the mine pulling out coal in place of mules. On investigation I was informed that some time in March, Korsmeyer & Langkrahr of Higginsville, invented a new wonder at their machine shop in the shape of a gasoline locomotive engine, and invited several parties to witness the test made. Among the spectators interested was Mr. Brandaw, who then and there conceived the idea of a mine machine, and he at once made suggestions to Mr. Korsmeyer to build a locomotive gasoline engine to be used in the mines for wheeling coal. I had the pleasure of seeing it at work at the latter date pulling ten loaded cars towards the shaft with perfect ease. The work of the little engine is perfect, and while the machine only weighs 1,400 pounds, yet it pulled more loaded cars than a mule could pull. Still another noticeable advantage that the engine possesses over the mule in this low coal is the saving of the expense of taking down the rock roof to admit the passage of the mule, as the engine can easily run in a space thirty inches high. I shall again call attention to this engine after witnessing a further test of its work. Thickness of coal, mode of working and price paid for mining is the same here as that of other mines in this locality. About forty employed.

Frank Coleman is operating a mine southeast of Higginsville to supply local trade.

S. G. Emison operates a mine near Higginsville. Mine entered by a drift and ventilated by a furnace. Coal eighteen inches thick and worked on the longwall plan. Coal taken away in wagons and consumed at Higginsville and surrounding country.

M. Woskoski is operating a mine south of Higginsville to supply the local trade.

J. Losner Mine. Formerly known as the Hughes' mine. It is located three-fourths of a mile west of Higginsville. Shaft seventy-two feet deep; operated by horse power. Ventilation is furnished by a furnace, and properly attended to, gives satisfactory results, but complaints have been received that the furnace is greatly neglected during

the day as well as tardiness in starting the fire early enough in the morning. Formerly the output of this mine was limited and confined to the local demand, but during the past year a side track has been constructed and shipping connections will be made with the Chicago & Alton railroad. The same seam of coal is worked here as at all the other mines in this locality, and the same price paid for mining. From thirty to forty men employed. Product shipped to Kansas City.

Consolidated Farmers' Coal Company—G. W. Stealey, superintendent. This company owns and is operating five mines in the surroundings of Higginsville. All of the mines are working on the same vein of coal, and the longwall plan with the movable face track in use at each mine and the same price is paid for mining, with other conditions similar to other mines in this vicinity. Mine No. 1 is a shaft seventy feet deep, and operated by machinery. It is located on the western outskirts of the city, and has shipping connection with the Chicago & Alton Railroad. The ventilation is furnished by a fan, and while this is the oldest mine in the county, and the air having a long route to travel, I found the ventilation very satisfactory on my first visit of inspection, September 30, 1898, with the mine otherwise in excellent condition. May 30, I made another inspection and found the ventilation as well as other conditions, satisfactory. From forty to fifty men employed.

Mine No. 2 is also a shaft and located two miles west of Higginsville. This mine is better known as the Windsor mine. Shaft forty-five feet deep, and hoisting is done by steam power. Ventilation is furnished by a furnace with very fair results. This is also an old mine, and its worked-out dimensions are very extensive, but by paying close attention to the furnace (and starting the fire early enough in the morning to remove all the impurities accumulating in the air through the night) before the men start to work, the ventilation has proven very satisfactory. I made two inspections of the mine during the year, September 30, and May 30, and its condition was satisfactory at both dates. About forty men employed.

Mine No. 5 is located one and one-half miles southwest of Higginsville. It is a slope opening and ventilation is produced by a furnace. This mine is operated under a contract, to place the coal on the cars at a given figure.

Mines Nos. 3 and 4 did not operate last year.

Mine No. 6 is located in the same neighborhood as No. 5, and has shipping connection with the same railways. Shaft thirty feet deep; hoisting by horse power. Ventilation is furnished by a furnace with excellent results. In fact at both dates of inspection during the past

year I found too much air traveling to be comfortable, as it was fresh direct from the surface. The covering over the coal at this mine is very shallow, causing considerable water to flow into the mine during wet seasons, but it is promptly handled by steam pumps. During the slack time in summer, this company makes every necessary improvement in each of its mines by shooting down rock to make height for mules, setting doors, repairing roadways, remodeling their hoisting machinery, and putting the mines in good running trim for the fall and winter trade. About sixty men find employment at this mine.

Mine No. 7 is entered by a drift and ventilated by a furnace. It is located in the same locality as mine No. 6, and has shipping connection with the same railways. Thickness of the coal, mode of working and the same price is paid for mining here as that at other mines. The product of the mines operated by this company is consumed at Kansas City and points west.

DOVER POSTOFFICE.

Dover Coal Company. Mine located at Steeleville, about two miles northeast of Dover, and has shipping connection with the Missouri Pacific Railroad. The mine is elevated one hundred feet above the railroad track, and the coal is let down an inclined plane; the loaded cars bring up the empties. The mine is entered by a drift and ventilated by a furnace. The airways are small and contracted, and the mine is not considered one of the best ventilated, but was found in a very fair condition at dates of inspection, September 16 and May 28. I discovered that ten new houses had been built at the mine for the use of miners. Thickness of coal, mode of working and price paid for mining is the same as at the mines in the locality of Higginsville and Lexington. About fifty men employed. Coal consumed at Kansas City.

The Fox mine was operated by Jas. Killen last year. This is a shaft forty feet deep; using horse power for hoisting. Coal eighteen inches thick and worked on the longwall plan. The mine is operated to supply home demand.

LEXINGTON POSTOFFICE.

Lexington is the central coal point of Central Missouri. The city is surrounded by coal mines, and it is the best mining point in the state. There are twenty mines, large and small, in the immediate vicinity of the city, of which twelve have shipping connection with the

Mo. P. R. R., while the other eight are local mines operated in the fall and winter to supply home consumption.

Bell & Greer are operating a mine south of the city across the railroad track. It has two drift openings and is ventilated by a furnace with good results. Coal eighteen inches thick and worked on the longwall plan. The coal is hauled away in wagons, and consumed at Lexington and vicinity. About twelve men employed in winter and six in summer.

Herman Marks is operating the mine formerly operated by Keist & Reilly. It is located one mile south of Lexington. Shaft sixty feet deep; horse power. Thickness of coal and other conditions the same as that of other mines in this locality. Mine operated to supply home demand.

O. M. Gaffin. Mine located east of Lexington and has shipping connection with the Mo. P. R. R. This mine was closed down several years ago, and remained closed until last fall, when Mr. Gaffin took out the water, cleaned the mine, and started to operate it. The railroad company put in a spur switch from the main road to the mine. It was making a large amount of water at date of inspection, which was handled by a pump, but I do not think that it can be successfully operated on account of the large amount of water. It is a shaft forty feet deep, using horse power. Mine operated on the same coal seam as all the other mines.

Rosewell Bros. Mine located east of Lexington. Shaft seventy-five feet deep; hoisting by horse power. Coal eighteen inches thick and worked on the longwall plan. Mine only operated in winter to supply local trade.

Clark Coal Company. Mine located east of Lexington on the bank of the river. It is entered by a drift and ventilated by a furnace with good results. Thickness of coal, mode of working and price paid for mining the same as that of other mines in this locality. Coal taken away in wagons, and mine only operated in fall and winter to supply home demand.

Thos. Walton. Mine joins the Clark mine, and has an underground connection with the latter. Ventilation is produced by the aid of a furnace with good results. The air enters an adjoining mine on the west, travels through the face of the workings and returns to the furnace. Coal eighteen inches thick and worked on the longwall plan, using the movable face track. Eighty-seven and one-half cents per ton is paid for mining in winter and seventy-five cents in summer. The coal is taken away in wagons and consumed at Lexington.

Seth Spruce is operating a mine on the west side of the Walton

mine, and has an underground connection with it. Mine supplies the local trade only.

Aull & Serret Coal Company. Mine located five miles east of Lexington, and has shipping connection with the Boonville & Lexington branch of Mo. P. R. R. Ventilation is produced by a furnace with very fair results. The mine was formerly known as the Kerdoff mine, and had been idle for a considerable length of time until the present operators took charge. During the time it remained idle it suffered great damage both to the airways and face of the workings, but was getting into good shape at date of last inspection. Coal twenty inches thick, worked on the longwall plan, with the movable face track in use. About twenty-five men employed. Coal consumed at Kansas City.

Henry Macey. Mine located two miles west of Lexington, connected with the Mo. P. R. R. by a spur switch. Mine entered by a drift and ventilated by a furnace. I made two inspections of the mine during the past year, and found the ventilation up to the requirements of the law and the mine otherwise in very fair condition. Thickness of coal, mode of working and price paid for mining are the same here as at the other mines. From thirty-five to forty men employed, and the product is shipped to Kansas City.

Lexington Coal Company—Major R. M. McDowell, general manager, and B. F. Wiley, superintendent. This company owns and is operating five mines in this county, all of which are located along the south side of the Missouri river, east and west of Lexington, and have shipping connection with the Boonville, Lexington and Kansas City Branch of the Mo. P. R. R. The mines are worked on the longwall plan, and the price paid for mining is the same as that of other mines in this locality, which is eighty-seven and one-half cents per ton in winter, and seventy-five cents in summer. The thickness of the coal on the west side of Lexington is about eighteen inches, while on the east side it is about four inches thicker, and runs as high as twenty-six inches in the McDowell shaft. The coal is underlaid by a soft fire clay mining, and is overlaid by a strong rock roof, which is well adapted for the longwall system of mining, as no timber is used or needed. The movable face track is used in all the mines of this company (except at Waverly); it is not only very convenient and economical, but of a decided advantage to the miner in loading his coal. The mines of this company are practically operated, well ventilated, and the requirements of the mining laws observed in every respect. All necessary improvements in and about the mines are attended to during slack times in the summer, and when the fall and winter opens,

the mines are in condition to furnish the coal and supply the demand. The roadways are dry, high, wide and kept clean, and generally found in excellent condition.

Riverton Mine—Peter Norde, foreman. Mine located two miles east of Lexington. It is entered by a drift, and ventilated on the east side of the workings by the aid of a furnace, while the west side is ventilated by the fan located at the McDowell shaft, as both mines are working the same face of coal. The ventilative current enters at the mouth of the drift and travels directly over the south entry to its terminus where it is divided to the east and west, furnishing plenty of air to every man in the mine. I made the first inspection of this mine on the third of November, and found it in good condition with the ventilation satisfactory. The doors on all cross-entries were found in good working order. I visited the mine again the first of June, and found it in excellent condition, with 110 men and eight mules working therein.

McDowell Shaft—Peter Norde, foreman. This mine is located about a mile from Lexington on the east, and about same distance west of the Riverton mine. This is a shaft fifty-five feet deep, equipped with machinery for hoisting, ventilating and draining the mine. Two inspections were made during the past year, namely, November 3, and June 1, and the mine found in excellent condition at each inspection. The ventilation which is produced by a ten foot ventilating fan, was above the demands of the law, and all safety appliances in good working order. This mine is worked very extensively, having a working face of 4,000 feet in width and sufficient to place 300 men at work. The ventilative current which enters and travels around this mine easily ventilates that number of men. In fact there is too much air passing at times, and when the gob is close and there is not much space between it and the coal the air is too strong to keep a light. All doors are made three inches thick, properly hung and so constructed as to close with the air current automatically when opened. Two doors are hung at each of the cross-entries, and are so far apart that in the passing of trips one door is always closed before the other is opened. From 100 to 110 men and eight mules employed.

The Glen Oak Mine—Geo. Burnstein, foreman. This mine is located about three miles east of Lexington, half a mile south of the river and connected with the Mo. P. R. R. by a spur switch. This is a shaft forty-five feet deep, equipped with first class machinery for hoisting. It is ventilated by a ten foot fan, with satisfactory results, and furnishes double the amount of air required by law. I made two inspections of the mine during the past year and found it in excellent

condition, with good doors properly hung, and the ventilative current split into three separate divisions. This is a productive mine and the best equipped in the county. The company lately built several houses at the mine for the use of miners, and also a school house. The same vein of coal is worked here as that at the other mines of this company, with other conditions the same. About 100 men employed.

The Graddy mine is located about two miles west of Lexington. Thos. Goodwin, foreman. Mine entered by a drift, and ventilated by a furnace. The ventilative current enters the mine at the mouth of the drift and travels the south entry until it reaches the cross-entries where it is divided to the east and west passing through the face of the workings on each side and unite again at the face of the south entry and return to the furnace. In fact it may properly be said that this mine is ventilated by a natural current as it is very seldom that a fire is required in the furnace. The upcast is sunk on the top of a hill with an elevation of 130 feet above the entrance to the mine, with a smoke stack again twenty-five feet above the ground making an elevation of 155 feet, causing a constant current of air to travel at all season when the temperature of the mine is above that of the surface. An electric mining plant was placed in this mine in the year 1892, and has been in constant use since with satisfactory results. The machines do the undermining, and miners are hired to load the coal, clean up the place and keep it in order, Fifty cents per ton is paid for this in winter and forty-five cents in summer. Eighty men employed.

The Hazwell mine, located at Meyrick Junction. Elias Spruce, foreman. Mine entered by a drift and ventilated by a furnace. I made two inspections of this mine during the past year and found it in good condition at each inspection with the ventilation satisfactory. This mine has been worked for a great number of years, and has extensive openings making a very long route for the air to travel, but still it is fairly ventilated and in good condition. All the mines of this company have undergone thorough repair several times during the past year, and this one not excepted. Coal chutes have been built here to coal engines. About forty men employed.

J. C. McGrew. Mr. McGrew owns and is operating two mines in this county, which are located about three miles west of Lexington and have shipping connection with the Lexington and Kansas City Branch of the Missouri Pacific Railroad. Both mines are entered by drifts, and ventilated by a fan. The two mines are connected, are working the same coal face, and ventilated by the same fan and may be termed one mine with two openings. The ventilative current

enters at mine No. 1 and is directed to the east of the workings and travels through the face of both mines, and returns to the fan which is set at another opening west of mine No. 2. The mines are practically operated, and satisfactorily ventilated. Two doors are set in each entry, and are hung so far apart that in the passing of trips one door is always closed before the other is opened, thus keeping the air current from traveling in a contrary direction to that intended. Coal eighteen inches thick, worked on the longwall plan, with the movable face track in use. The roadways are dry, high, wide and clean, and in excellent condition. On date of my second visit to the mine, I found a large force of men at work blasting down rock on the entries, and doing other improvements in and around the mine. Thos. Parks, superintendent.

MAYVIEW POSTOFFICE.

Mayview Coal Company. Mine located at Mayview and has shipping connection with the Chicago & Alton R. R. Shaft 125 feet deep; equipped with machinery for hoisting. Ventilation is produced by a furnace which was giving very fair results. This mine after being closed down for over a year, was leased by the present operators, last fall, the water was taken out and the mine cleaned, and at date of first inspection it was in very fair condition with thirteen men employed. The coal at this mine is low and faulty, and I very much doubt considering conditions the ability of its operators to successfully and profitably operate the mine.

Strasburg & Son. Mine located one mile east of Mayview, and has shipping connection with Chicago & Alton R. R. Shaft 105 feet deep; operated by steam power. I inspected the mine on the twenty-seventh of September, and found the air very weak and defective, owing to the dilapidated condition of the furnace; instructions were given to remedy the evil at once. I returned to the mine in about two months and found it closed.

NAPOLEON POSTOFFICE.

D. I. Moore operates a mine at Napoleon in the fall and winter to supply local demand. Mine entered by a drift and ventilated by a furnace. Four men employed.

WAVERLY POSTOFFICE.

The Allen Waverly Coal Company. Mine located at Waverly on the east side of the depot. Shaft 100 feet deep, and equipped with

steam power. This mine was formerly ventilated by a furnace, but the present operators have substituted a fan in place of the furnace, and at last inspection, May 26, the ventilation was found satisfactory all over the mine. The airways had also been cleaned and enlarged. Coal forty-five inches thick and worked on the double entry room and pillar plan, paying fifty-five cents per ton for mining unscreened coal. The mine has shipping connection with Boonville & Lexington Branch of the Mo. P. R. R. Thirty men employed.

Silver Creek Coal Company—Ed. Opie, superintendent. Mine located at Waverly. Shaft 120 feet deep, and equipped with horse power for hoisting. This is a new mine sunk and opened out last fall. While the shaft is sunk along side of the railroad, yet it has no shipping connection with it, and the mine was operated during the past winter to supply the local demands; some coal was hauled in wagons, loaded on cars at Waverly switch and shipped to Kansas City. We have lately been informed that other parties have bought an interest in the mine, and are now putting in a side track, and that they will put in machinery and enlarge its capacity. The coal at this mine is from four to four and one-half feet thick, and is overlaid by a black slate which makes excellent roof, and very easily secured by timbering. I look for this to be the great coal field of the state in the very near future. The coal in this section of the county extends for miles; the mines are practically dry, and the coal is extracted by shooting it off the solid. This coal when first introduced was condemned as of inferior quality, but I am convinced that it is a good steam coal, and would like to see some one taking interest enough in this coal field to give it a fair and a thorough test; there is a large body of coal here and it will be worked some day successfully. During my last visit to Waverly my attention was called to parties sinking a new shaft about three-fourths of a mile west of the above named mine, and also to several other parties who were prospecting in the same locality. I anticipate on my next visit to Waverly to find several new and extensive mines opened up in this coal field.

WELLINGTON POSTOFFICE.

Labor Exchange Coal Company—Mack Warner, superintendent. Mine located one mile west of Wellington. Shaft eighty-five feet deep; horse power. This is a new mine sunk and opened out last fall. It is situated close enough to the railroad to have a switch, but there is no shipping connection yet made. The mine is operated to supply the local trade; it is working the same coal seam as that worked at Lex-

ington and the thickness of the coal, and other conditions are the same.

Wellington Coal Company. Mine located two miles west of Wellington, and has shipping connection with the Lexington & Kansas City Branch of the Mo. P. R. R. Shaft forty feet deep; using horse power for hoisting. Ventilation is furnished by a furnace, with satisfactory results. I made the first inspection on the second of November, and found the mine in excellent condition. The roadways are high and mules are now worked to take out the coal. Thickness of coal, mode of working and price paid for mining is the same at this mine as that of other mines in this locality. Forty men employed. Coal shipped to Kansas City.

Carter & Son. Mine located two miles east of Wellington. Mine entered by a drift, ventilated by a furnace and working the same coal seam as the other mines in this vicinity, with other conditions the same. Shipping connection is made with the Mo. P. R. R., and the coal is consumed at Kansas City. Twenty-five men employed.

Jas. Price is operating a small mine near Wellington to supply local trade.

F. Kerry (col.), operates a local mine at Wellington in fall and winter.

LINN COUNTY.

Production, 72,081 tons.

Coal has been known to exist in Linn county for a great number of years, and mining is now being prosecuted in various parts of the county, but only on a small scale to supply the home consumption. While the county is nearly all underlain by the coal measure formation, there are only two commercial mines now in operation, located at Brookfield and Marceline, all others are local mines.

BROOKFIELD POSTOFFICE.

Brookfield Coal Company—Geo. Champ, foreman. Mine located half mile east of Brookfield, and has shipping connection with the Hannibal & St. Joe R. R. by a spur switch. Shaft 155 feet deep; using steam power for hoisting; ventilation is furnished by a furnace with very fair results. I made two inspections of the mine during the year. November 18 and again on the sixteenth of May, and found it in very fair condition at each date. The larger part of the old workings had been abandoned and new works opened on the straight south entry near the shaft bottom. Coal twenty-eight inches thick, but there is

a layer of slaty coal (known to miners as black jack), running regular through the center of the coal, which has to be thrown to the gob. Mine is worked on the longwall plan, and ninety cents per ton is paid for mining in winter, and seventy-five cents in summer. Some of the product is shipped, but the greatest portion is consumed at Brookfield and surroundings.

The old Clark mine is now operated by Burdell & McElhaney. This is a shaft 150 feet deep with horse power for hoisting. This mine has been operated in violation of law, and in opposition to the instructions of the mine inspector. Parties living in the vicinity of the mine and dependent on mining for a living, pretended to buy or lease in order to evade the law, and while realizing the dangerous and dilapidated condition of the mine would work therein and take the chance of losing their lives in doing so. However, the present owners are reliable parties and have promised to sink another shaft and put the mine in a safe condition. Coal twenty-eight inches thick, and worked on the longwall plan. It is taken away in wagons and consumed at Brookfield and surrounding country.

The Williams mine is located two miles east of Brookfield. Shaft 150 feet deep; operated by horse power. This is a new mine sunk about a year ago. I made first inspection of it on the eighteenth of November, and found seven men at work without air or airways provided for, and badly managed generally. I instructed Mr. Williams to sink an escape shaft at once and put other parts of the mine in better condition. May 16 I visited the mine again, and found that an escapement was in course of construction, the mine not being operated, made no inspection. Thickness of coal, mode of working and price paid for mining is the same as at other mines in the locality. Coal consumed in the surrounding country.

The Scheafer mine is located two miles east of Brookfield. Shaft 150 feet deep; equipped with machinery for hoisting. This is a new mine sunk and opened out in the summer of 1898, and at date of inspection, November 18, there were fourteen men at work, making a circle around the shaft bottom. May 16 I visited the mine again and found it properly opened and a good current of air circulating, which was furnished by a furnace. An escapement shaft was also in course of construction, and over half way down at the latter date. This mine is equipped to do a large business, and if convenient to a railroad could be made a productive mine, but situated two miles away its output is limited and confined to the local demand. Coal 28 inches thick, and from ten to fifteen men employed.

MARCELINE POSTOFFICE.

Landreth & Sons. Mine located at Marceline. Shaft 130 feet deep; operated by horse power. Ventilation is produced by a furnace with satisfactory results. Coal twenty-eight inches thick, worked on the longwall plan, and one dollar per ton paid for mining the year around. Coal taken away in wagons and consumed at Marceline.

Marceline Coal Company—Jas. Hemmings, superintendent, and John Burns, foreman. Mine located at Marceline, and connected with the Santa Fe R. R. by a switch. Shaft 185 feet deep; equipped with first class machinery for hoisting. The ventilation is furnished by a twelve foot ventilating fan, which was making sixty-three revolutions per minute at date of inspection, September 23, seventy revolutions per minute May 17, date of last inspection, giving entire satisfaction at both dates. The ventilative current enters through the main shaft, and travels over the south entry to its terminus, where it divides to the east and west, and passes along the face of the workings to the upcast, the air from the east side passing to the fan shaft over an air crossing, while the whole volume of air is supposed to travel to the face of the main south entry, yet enough air was found escaping at each cross-entry to keep them healthy for men and mules to travel through them. The air is well conducted considering the area through which it has to pass and the demands made upon it. Permanent aircourses are constructed from the fan shaft to the face of the workings on each side, six feet high and about seven feet wide for the return of the air, and are kept in good condition in fact the system is practical and the mine well ventilated. Gas men are now employed, who make the circuit of the mine every morning and examine the same and report everything safe before the miners are allowed to enter. A record is kept in a book of the result of the daily examinations, showing the condition of the mine for each day operated; this book the inspector examines upon his visits to the mine. Coal twenty-eight inches thick and underlaid with fire clay mining. The roof is a mixture of hard slate and soapstone fairly well adapted for the longwall system of mining in use here. There were 140 and 200 men at work respectively, at dates of inspection and eight mules. One dollar per ton is paid for mining. The product is largely consumed by the Santa Fe R. R. Company.

LIVINGSTON COUNTY.

Production, 890 tons.

Mining in this county is quite limited, although coal has been developed at several points within its borders. There are three mines in operation about five miles north of Chillicothe, two of them are operated by J. C. and W. A. Cox, and the other by John Adams. The three mines are operating on the same coal seam which is about twenty inches in thickness, all are shafts, and hoisting is done by horse power. The coal is taken away in wagons and consumed at Chillicothe and its vicinity.

The McRoberts Bros. are operating a mine near Moorsville. Shaft fifty-one feet deep; hoisting by horse power. Coal eighteen inches thick, and worked on the longwall plan. Coal consumed in the surrounding country.

There are other mines in this county which are operated during the winter season on a small scale, which we had not the time to visit, the output being small with but two or three men at work.

MACON COUNTY.

Production, 739,293 tons.

Macon county is one of the most important coal producers in the state, and continues to be first in the rank of the coal producing counties, with an output during the last year of 739,293 tons. This amount would have been largely increased but for the suspension of work at the large mines operated by the Kansas & Texas Coal Company during the latter part of May and the entire month of June. To produce this amount of coal 14 mines were operated and 1,620 men employed. The average price received at the mines per ton of coal was 97 cents, and the total proceeds from the sale of the product amounts to \$723,132. Powder during the past year cost the miners \$42,005 there having been 20,769 kegs consumed. The same seam of coal is worked throughout the county, and the room and pillar method of mining universally practiced. The larger mines are located at Ardmore, Bevier and Lingo, but there are a number of small mines in different parts of the county operated during the cold season to supply the home demand. Three inspections were made of all the larger mines during the past year, and their condition found as follows:

ARDMORE POSTOFFICE.

Kansas & Texas Coal Company—B. F. Hobart, president; F. W. Doubleday, general manager, and Arthur Vail, superintendent. This company owns and is operating several mines at Ardmore, all of which have shipping connection with the Wabash R. R. The same seam of coal is worked and all are operated under the room and pillar system of mining.

Mine No. 48—Robt. Moss, foreman. Shaft sixty feet deep; and equipped with first class machinery for hoisting, which is kept in good repair with all the safety appliances in a like condition. The mine is ventilated by a twelve foot fan, with the ventilative current divided into three separate divisions, giving entire satisfaction at dates of inspection. The mine makes considerable water which is taken out by large steam pumps. The roof in some parts of the mine is soft, friable, and hard to keep in a safe condition. The coal is found faulty in some places, making the operating expenses heavy, it is from three to four feet thick and worked on the double entry room and pillar plan, paying fifty cents per ton for mining unscreened coal. About 140 men employed.

Mine No. 57—George Feris, contractor. Mine located one mile south of Excello. Shaft forty feet deep; using steam power for hoisting. Coal proved low and faulty and the mine was found idle.

Mine No. 58—Weeks & Wiles, contractors. This mine is located at Ardmore, southwest of the store. Drift opening and ventilated by a furnace. This coal is also faulty and at date of last inspection, May 18, most of the men were drawing pillars.

Contract Mine-No. 59—Week & Wiles, contractors. Mine entered by a slope, and ventilated by a furnace which was giving good results at dates of inspection. The coal was formerly taken out of this mine by mules, but last spring machinery was put in to take their place and the coal is hauled out now by steam power. Coal four feet thick, worked on the double entry room and pillar plan, and paying fifty cents per ton for mining unscreened coal. About seventy men employed.

Contract mine, operated by Geo. Burge. Drift opening, and ventilated by a furnace, the same seam of coal is worked here as at the other mines. About twenty-five men employed.

BEVIER POSTOFFICE.

Bevier Black Diamond Coal Company—R. Brewett, foreman. Mine located one and one-half miles southwest of Bevier and connected with the Hannibal & St. Joe. R. R. by a spur switch. Shaft sixty feet deep; and equipped with good machinery for hoisting. Ventilation is furnished by a twelve foot fan, which was making 110 revolutions per minute (at first inspection, September 19), and passing 13,422 cubic feet of air around the workings in same length of time. This volume of air was circulating around the mine in one current at this date, ventilating the ninth, tenth, eleventh, twelfth and thirteenth east entries, and eleventh, twelfth, thirteenth and fourteenth west entries where about 130 miners were at work; this current while sufficient in quantity was made to perform too much work and became impure. Instructions were given to erect an overcast for the eleventh and twelfth west entries and make another split. On the seventeenth of January, I visited the mine again and made another inspection. I discovered that the overcast had been built, and the air current was divided into four divisions, and while the quantity was found sufficient in all parts of the mine, yet the air was much vitiated with black-damp in the thirteenth and fourteenth west entries, the last points to be served by currents. June 13, I made another inspection and found that all coal on the east entries had been worked out and that section of the mine abandoned, and most of the work was then confined to the thirteenth and fourteenth west. I also found several other parts of the workings confined to drawing pillars and the mine will soon be numbered among the has been. I found the ventilation very fair on my last inspection all over the mine. Coal four feet thick, worked on the double entry room and pillar plan, paying fifty cents per ton for mining unscreened coal. There were 130, 140 and 80 men employed, respectively, at dates of inspections, and fourteen mules.

Northwestern Coal Company—John H. Bovard, manager, and Geo. Michael, foreman. This mine is known as No. 4, and is located at Bevier and has shipping connection with the Hannibal & St. Joe R. R. Shaft sixty feet deep; operated by machinery. Ventilation is produced by a twelve foot fan, and giving very fair results. I made three inspections of this mine during the past year. First inspection was made September 22, 1898. I discovered on this visit that the escapement shaft was completed and a stairway built in it. Preparations were also made to start up the north side which had been closed

for years. On the twentieth of January, I made another inspection and found the new works opened on the north side; and the ventilation very satisfactory. June 14, I visited the mine again and a deficiency was found in the ventilation of the seventeenth and eighteenth west entries owing to the contraction of the aircourses which was caused by a squeeze. These two entries get the first of the air and should be the best ventilated part of the mine, but being nearly closed, very little air could pass, but men were put to work night and day to open it out. All other parts of the mine was satisfactory. Coal four feet thick, worked on the double entry room and pillar plan, and paying fifty cents per ton for mining unscreened coal. There were 50 110 and 175 men at work, respectively, at dates of inspection.

Kansas & Texas Coal Company—Ed. Vail, superintendent. This company operated three mines in the vicinity of Bevier during the past year, all of which have shipping connections with the Hannibal & St. Joe R. R.

Mine No. 7—Jas. Monihan, foreman. Mine located about a mile south of Bevier. Shaft fifty-five feet deep, and equipped with good machinery for hoisting. Ventilation is produced by a ten foot fan with satisfactory results. I made the first inspection of this mine, September 21, 1898. I found the ventilation on the north side satisfactory, but the current on the south side was overloaded with work and much vitiated with black-damp. This current was ventilating the first, second, third, fourth, fifth, sixth, seventh and eighth west entries, and the fifth, sixth, seventh and eighth east entries. Instructions were given to the company to divide the current into two or more splits. January 18, I made another inspection of the mine, and found a new aircourse had been excavated on the south side along side the back entry from the shaft to its terminus, that an overcast had been built on the sixth east entry which gave the fifth and sixth east a separate current, and another overcast was in contemplation at the fourth west. June 14, I made another inspection, and found that another overcast had been erected and air was now divided into three currents on the south side, and one on the north. There was no work in the mine on the latter date, the men had suspended work in sympathy with their fellow-miners, but day hands were at work keeping up repairs. This is the most extensive mine in the county, and very few excel it in the state, and it is practically operated. The coal will average four feet in thickness. The mine is worked on the double entry room and pillar plan; fifty cents per ton is paid for mining unscreened coal. From 250 to 275 men are employed and about

twenty mules. The coal is shipped over the Hannibal & St. Joe. R. R. to Kansas City and other points.

Mine No. 43 was inspected January 19, at which time found the mine nearly worked out and all the men employed in drawing pillars. Early in June the company hauled out the pit cars, took up the rails and abandoned it, as there was not coal enough left to pay the expense of keeping the mine in repair.

Mine No. 61—James Monihan, foreman. Mine located two miles south of Bevier. Shaft 125 feet deep; and equipped with first class machinery for hoisting. This is a new mine sunk and opened out during the past year, and destined to be the largest producer in the state. A shaft was sunk here some eight years ago by an Iowa party; but it remained idle until a year ago, when this company bought and developed the mine. Machinery was erected and a railroad track laid up to the mine, and operations commenced, but the equipment erected at this mine is intended to serve a temporary purpose as a larger shaft is being sunk about 500 feet from the present one and will be equipped with the machinery formerly used at mine No. 46. As soon as the new shaft is fully equipped it will be used for hoisting, and a large fan will be placed at the present hoisting shaft which will be used for an escape, and a fan shaft. Air-courses were in course of construction at date of my inspection, which are about sixty-four feet in area, and timbered with the very best and largest of timber and neither labor nor money have been spared by the company to make this the best mine in the state, as this new shaft at the time of my last visit had not been fully opened up or its permanent system of ventilation progressed far enough to enter into a detailed account of the same, I shall have to defer further mention until my next year's report. Coal four feet thick, and worked on the double entry room and pillar plan, and paying fifty cents per ton for mining unscreened coal.

Watson Coal Company—Wm. Rivers, superintendent. Mine located one mile south of Bevier, and has shipping connection with the Hannibal & St. Joe. R. R. by a spur switch. Shaft eighty-five feet deep; and equipped with first class machinery for hoisting. The ventilation is furnished by a twelve foot fan, with satisfactory results. I made three inspections of the mine during the past year, viz., September 22, January 18, and June 15, and found the mine in excellent condition at each inspection. At date of my second inspection, I discovered that considerable black-damp was coming out of the south entries which were recently worked out and that it traveled with the air, making it too impure for the men to breathe, and at my sugges-

tion, Mr. Rivers erected an overcast and reversed the current, taking the impurities away with the return air. Another escapement was in course of construction at date of my last visit to the mine, and is at this writing doubtless completed. This escape will be used only in case of fire, as there is already an escapement shaft connected with the mine which is well equipped with a traveling way in it; it was considered rather too close to the hoisting shaft and top buildings, there being considerable risk in case of a fire, and the company sunk another shaft for further safety. Coal four feet thick, and worked on the double entry room and pillar plan, paying for mining fifty cents per ton for unscreened coal. At the dates of first and second visits to this mine I found 120 men employed, and 200 at date of last inspection, and twelve mules. The coal is shipped to Kansas City and points west.

James & Son are operating a mine near Bevier. Shaft fifty feet deep; and hoisting by horse power. Coal four and one-half feet thick, worked on the room and pillar plan; the mine is ventilated by a furnace. Coal consumed in the surrounding country.

R. Thomas & Son operates a mine at North Bevier. Shaft 135 feet deep; and equipped by horse power. Coal four feet thick, and worked on the room and pillar plan.

LINGO POSTOFFICE.

Little Pittsburg Coal Company—A. G. French, manager, and Chas. Parker, foreman. Mine located at Lingo, having shipping connection with the Hannibal & St. Joe. R. R. Shaft 135 feet deep; and operated with steam power. Ventilation is furnished by a twelve foot fan, and the mine is fairly ventilated. This mine is worked on the long-wall plan, but the roof is not very well adapted for this plan of mining, as it is soft and friable, and often breaks and crumbles down along the face, thus filling up the air-courses and greatly obstructing the free and easy passage of the ventilative current. The mine is dry and very hot, the heat being caused from spontaneous combustion in the refuse of the mine stowed away in the gobs. This heat being carried along by the air current comes in contact with the roof causing it to sweat and then crumble, requiring considerable expense in the effort to make and keep it secure. It is also a difficult mine to ventilate, but under the circumstances as every effort is being made by the foreman to force plenty of air around every working place, with fairly good success, all is accomplished that can reasonably be expected. I made my first inspection of the mine on the twenty-second of September, 1898, and found the ventilation satisfactory. Work

at this date was prosecuted on the east and west sides of the mine. On the sixteenth of May, I made another inspection and discovered that the east side had been abandoned, and all the work was confined to the west side. Great improvement had also been made in the ventilation by reversing the current. The ventilative volume of air now travels over the west entry direct from the downcast to the men, returning through the old workings after leaving the men over an air-crossing to the upcast. I found the air fresher and stronger than on my former inspection. Coal three and one-half feet thick. A layer of rock runs regularly through it near the bottom about six inches in thickness, and this is quite a drawback to the economical working of the coal. Sixty-five and seventy-five men were employed, respectively, at dates of inspection. The product is shipped to Kansas City.

MACON CITY POSTOFFICE.

Considerable mining is being done in the vicinity of Macon City during the winter season to supply the local demand. Most of the mines are located along the bank of creeks, and have drift openings. The coal mined is the same as that mined in other parts of the county, the output and other information concerning these mines will be found in the statistical table of this county.

MONROE COUNTY.

Production, 960 tons.

Monroe county has a small coal area, the coal bearing rocks occupying the extreme southern portions of the county, while north and east they occur in the hills in small patches, but very little mining is carried on in the county.

PARIS POSTOFFICE.

There are several parties who operate mines and take out coal in the surroundings of Paris during the fall and winter to supply the home consumption. All the mines are working the same coal seam, are entered by drift, and mined on the long-wall plan. Names of each party, and output of mines, with other information will be found in the statistical table of this county.

NODAWAY COUNTY.

Production, 2,350 tons.

Mining has been prosecuted in the vicinity of Burlington Junction and Quitmah for a great number of years, but only on a small scale to supply home demand. The coal seam is thin and varies in its thickness from twelve to sixteen inches. The mines are entered by vertical shafts, and horse power is used for hoisting. Owing to the thinness of the coal and its scarcity in this part of the county, from \$1.75 to \$2.00 per ton is paid for mining. All other information concerning these mines will be found in the statistical table of this county.

MONTGOMERY COUNTY.

Production, 2,670 tons.

Montgomery county is situated on the eastern margin of the coal bearing rocks, and mining is only prosecuted at and near Wellsville.

WELLSVILLE POSTOFFICE.

Wellsville Black Diamond Coal Company. Mine located one mile south of Wellsville. Shaft forty-five feet deep, and hoisting by horse power. Coal twenty-eight inches thick, and worked on the longwall plan. Coal taken away in wagons and consumed at Wellsville and surrounding country.

J. M. Appling operates a mine south of Wellsville during the fall and winter to supply the local demand. Mine entered by a shaft, and hoisting by a horse. Coal consumed in the surrounding country.

Buford Noel operates a mine at Wellsville in the fall and winter. Coal consumed in the vicinity.

Henry Whitehead operates a mine southeast of Wellsville. Shaft thirty feet deep; horse power. Coal consumed at Wellsville.

A party of miners sunk a shaft last fall and operated it through the fall and winter to supply the local trade. Some of the coal was also shipped over the Wabash R. R. Every one of the above miners are working the same coal seam, on the same methods, and are paying same price per ton for mining, viz., seventy-five cents, summer and winter.

PETTIS COUNTY.

Production, 3,200 tons.

For years coal has been mined in different parts of Pettis county, in the neighborhood of Dresden, Dunksburg, Hughesville and Lamonte, all of the mines are, however, comparatively small, the product of all being largely used for local purposes. The coal is found in pockets at various depths and thickness. A company recently sunk a shaft one and one-half mile northeast of Lamonte on Judge Conley's land, and struck three feet of coal at a depth of eighty feet, but in developing the mine the coal proved to be full of pyrite, it was of a very inferior quality, very expensive to mine, and had to be abandoned. Another extensive pocket of coal has been discovered, and is now worked at Hughesville by Mr. A. Carson. The coal was struck at a depth of sixty-five feet and the mine is equipped with steam power for hoisting. The coal is thirty inches thick, and of good quality for steam or domestic purposes and could be made a productive mine if it had better shipping facilities, but located two miles away from a railroad, the output is confined to local demand. An air-shaft was sunk during the past year, and a furnace built. Coal consumed in the surrounding country.

PUTNAM COUNTY.

Production, 126,673 tons.

Putnam county for the year just closed, shows an output of 126,673 tons of coal, and holds her place as the seventh in the rank of the coal producing counties of the state. Eight mines were operated during the past year, and 401 men employed. Following is a description of the larger mines with a statement as to their location and condition as found at dates of inspection:

BLACKBIRD POSTOFFICE.

Blackbird Coal Company. Mine located at Blackbird and has shipping connection with the C. B. & K. C. R. R. Shaft fifty-three feet deep, operated by steam power and the ventilation furnished by a twelve foot fan, but owing to small and contracted air-ways, very little air was found traveling around the mine, and but very little work was done at the mines during the past year. Coal thirty-two inches thick, and worked on the long-wall plan. The product is shipped to points north.

MENDOTA POSTOFFICE.

Mendota Coal Company—F. B. Ketchum, president, and B. H. Johnson, superintendent. This company owns and operated three mines in this county during the past year, all of which are located at Mendota, and have shipping connection with the C. B. & K. C. R. R. All the mines are working the same vein of coal, which will average from thirty-two to thirty-four inches in thickness, separated by a clay band from one to two inches thick, running regular through the coal, which is underlaid by a fire clay mining and overlaid directly by a strong black slate about ten inches thick, and next to the slate lies the cap rock from two to six feet in thickness, which renders this seam well adapted for the long wall or room and pillar methods of mining, but the room and pillar is universally used here. The mines are operated on the double entry system, and rooms are turned off from each entry, these rooms are turned off double and carried forty feet wide, with a wheel road on each side and two men in a room; the air goes in one road around the face of the room and out the other, which is a very satisfactory way of ventilating. The coal is worked by undermining, cutting the ribs or sides and wedging it down, what is known as pick work, or practical mining. The mines are dry, safe, clean and healthy, and practically operated, and are kept in good condition. Following is a statement of their location and condition as found at dates of inspection:

Mine No. 2—Ben Weymouth, foreman. Mine located two miles east of depot. Shaft sixty-three feet deep; and operated by steam power. Ventilation is furnished by a twelve foot fan with satisfactory results. I made two inspections of this mine during the past year. First inspection was made on the fifteenth of November, the fan at this date was making seventy revolutions per minute and 15,130 cubic feet of air was found passing in same length of time. This volume was split into the east and west, the current going east traveling over the straight east entry to its terminus, through a header to the second east, and from second to third east and returning to the upcast (the fan at this date was forcing the air into the mine), the current traveling to the west ventilating that part and returning to the upcast after finishing its work in a very satisfactory manner. April 29 I made another careful inspection and discovered that a connection was to be made in a few days between the first southeast with the second southwest entries which will shorten the route of the air cur-

rent 1,200 feet, thus giving stronger and fresher air to the men at work. I found the ventilation satisfactory at this inspection with the exception of the two entries mentioned above, and as soon as they are finished a sweeping current will be found passing through. It is but justice for me to state here that every effort is made by the management to keep the ventilation up to the letter of the law, and any suggestion or recommendation made by the inspector for the betterment of any part of the mine is promptly attended to. Entry driving is mostly done during slack times in summer, and headers or air-courses are driven across at the face of entries to carry the air through the face of the work. About 150 men employed, and eight mules.

Mine No. 4—Ed. McCullum foreman. Mine located one mile north of depot, and has shipping connection with the C. B. & K. C. R. R. Mine entered by a slope and ventilated by a furnace. I made first inspection of this mine on the fourteenth of November, and found the ventilation up to the requirement of the law and the mine otherwise in good condition. Considerable faulty coal is encountered here which greatly reduced the output of the mine. I visited the mine again on the twenty-eighth of April, and found all the work confined to drawing pillars and the abandonment of the mine will soon follow.

Another slope was opened north of No. 4, and had an underground connection with the latter, but the coal proved very faulty, the mine will soon be worked out.

PEARL CITY POSTOFFICE, IOWA.

Rodgers Bros. Coal Company. Mine located a mile north of depot, near the Iowa line. Mine entered by a drift and ventilated by a furnace. This company abandoned the old drift and opened another one during last year. Coal about three feet thick, and worked on the room and pillar plan. The product is hauled away from the mine in wagons, loaded on cars at Mendota, and shipped over C. B. & K. C. R. R. Twelve men employed.

The Star Coal Company operates a mine near the state line, drift opening, and ventilation furnished by a furnace. Coal thirty-two inches thick, and worked on the room and pillar plan, the product is hauled over a tram-way and loaded on cars at Pearl City, and shipped over the C. B. & K. C. R. R.

UNIONVILLE POSTOFFICE.

Emporia Coal Company—Geo. W. Evans, superintendent. Mine located one and one-half miles north of Unionville, and has shipping connection with the C. B. & K. C. R. R. Shaft 110 feet deep; and

equipped with first class machinery for hoisting. I made the first inspection of this mine on the sixteenth of November, the ventilation at this date was furnished by a furnace, but a fan had been purchased and was on the ground ready to be put up. The work at this date was confined to the west off of the south entry where about thirty-five men were at work. April 27 I visited the mine again and found the fan still lying on the ground rusting out instead of being set, and the furnace furnishing the ventilation. In fact there was no furnace built as the intention from the first was to equip the mine with a ventilating fan. A temporary furnace is being used, and has given satisfactory results for the mine is well ventilated. Coal about thirty-two inches thick, and worked on the room and pillar double entry plan, the roadways are high, dry and clean, and the mine is kept in first class condition.

RALLS COUNTY.

PERRY POSTOFFICE.

Production, 16,014 tons.

Ralls County Coal Company. Mine located one and one-half miles north of Perry, and has shipping connection with the Hannibal & St. Louis R. R. Shaft forty-eight feet deep, and operated by horse power. The ventilation is furnished by a furnace, and is fairly ventilated with the exception of the north entry where deficiency was found, but an air-course was in course of construction which, when through, will be found satisfactory. The coal is twenty-four inches thick, and worked on the long-wall plan. It is underlaid by fire clay mining, and overlaid by slate roof which is very friable and hard to keep secure, but is better adapted for the long-wall than the room and pillar method. The coal is of fine quality for both steam and domestic purposes and commands a ready sale and a good price in the market. Eighty-six cents per ton is paid for mining summer and winter, and about forty men employed.

Clark Coal Company. Mine located one and one-half miles north of Perry, and has shipping connection with the Hannibal & St. Louis R. R. Shaft sixty-six feet deep, and equipped by horse power for hoisting. This is a new mine sunk and opened out recently. It is located about half a mile north of the Ralls county mine, and operating on the same coal seam and the same system and paying the same price for mining. The mine was not fully developed at date of my visit June 21. Ten men employed.

RANDOLPH COUNTY.

Production, 354,830 tons.

Randolph county is one of the large producing counties of the state, and continues to hold her place as the fourth in the rank of the coal producing counties with an output of 354,830 tons during the past year. This amount would have been considerably increased but for the shutting down of some of her principal and most productive mines the latter part of the year. The county is underlaid by the coal measure formation and mining is prosecuted in every township, her principal mines being located at Elliott, Higbee, Moberly and Huntsville, with many small mines operated at other points which supply the local demand. Twenty mines were operated here during the past year, and 881 men employed. For the detailed information relating to the respective mines see table of this county, and the following for the description, location and condition of the same:

ELLIOTT POSTOFFICE.

Elliott Coal Company—J. C. Fleming, superintendent, and George Morris, foreman. Mine located at Elliott, and has shipping connection with the M. K. & T. R. R. Shaft 145 feet deep, and equipped with good machinery for hoisting. Ventilation is furnished in a very satisfactory manner by a twelve foot fan; made three inspections here during the past year and found the ventilation good at each inspection and the mine otherwise in excellent condition. At date of my first inspection the most of the work was confined to the south side, but as the demand for coal increased, more work had been opened out on the north side. I found about twenty-five men at work, and a sweeping current of fresh air circulating around the works. This shaft was sunk and the mine opened out in the summer of 1878, it is, therefore, not only one of the oldest operated mines in the state, but at the same time a good producer. The ventilation is well conducted around the workings, furnishing plenty of air to every working place. The air-courses are high, wide, and clean, and well taken care of; a condition always necessary in supplying the miner with air. The working of the fan at this mine is smooth and easy, and can not be heard until very near it. Coal nearly four feet thick and worked on the long-wall plan, and pay seventy-five cents per ton for mining clean coal. The roadways are high, dry, wide and clean, and in good condition.

Employment is given to about 125 men. The product is consumed by the railroad company. Chutes having been erected at the mine to coal engines.

The Santiago Mines are located about three miles west of Elliott, and have shipping connection with the M. K. & T. R. R. During the fiscal year just closed the Elliott Coal Company bought a large tract of coal land near Elliott, on the west side of the railroad and opened out two mines. A tram-way was built from the mines to the railroad, a distance of two miles, and the coal is hauled by a dummy engine. A large building has been erected at the railroad to land and dump the coal, and a revolving screen built to clean and separate the nut from the fine coal. An elevated trestle is also erected to take the coal from the ground to the tippie which is worked by the cable rope system. Both mines are entered by drifts and ventilated by furnaces. The same seam of coal as that at Elliott is worked here and the mines are under the same management. The coal at these mines will average over four feet in thickness, and is worked on the room and pillar plan; the coal is mined by shooting it off the solid and loaded as run of mine coal. It is overlaid by a mixture of slate and soapstone which makes excellent roof, it being easily secured with timber. The mines are dry, practically opened and in good condition. Employment is given to about seventy men at present, but as the mines are further developed this number will be more than doubled.

HIGBEE POSTOFFICE.

Higbee Coal Company—Wm. Walton, superintendent, and Hiram Hyde, foreman. Mine located one-half mile west of Higbee, and has shipping connection with the Chicago & Alton R. R. Shaft 170 feet deep, and equipped with first class machinery for hoisting. Ventilation is furnished by a ten foot fan, with very fair results. Made three inspections of this mine during the past year, first inspection was made on the thirtieth of August, 1898. The fan at this date was making 100 revolutions per minute, and 8,160 cubic feet of air was found passing in same length of time, test taken on the west entry; but this was only a part of the volume, as another current was traveling around the east entries the air being split at the overcast. The air was found very satisfactory at this visit with the exception of the straight north where it was weak and sluggish and very much vitiated with black-damp; but an air-course was then being driven from the straight north to meet an east entry from the second north which was nearly through; this will greatly improve the air. January 31 I made another inspection, the above mentioned connection had been made

and the ventilation was found satisfactory all over the mine. Inspected the mine again on the thirtieth of June, the fan at this date was making 110 revolutions per minute and 8,400 cubic feet of air was found passing (measurement taken outside of overcast before it was split). This volume was divided and circulated around the east and west entries and united again at face of north entry, the current to the west passing over an air-crossing. I discovered on this visit that parts of the mine had taken fire from spontaneous combustion in the refuse, and as such parts had to be shut off it caused considerable interference with the conduct and control of the air current as well as great annoyance in the mine; but the fire was well under control then, and has since been fully subdued. All the entries have been timbered and cleaned during the past year, and are now in good condition. Air-courses have been cleaned and enlarged, and as soon as another connection is made on the east side (which was within sixty feet of being through at date of last inspection) the ventilation will be good all over the mine. The roof overlying the coal is of the nature of soap-stone, soft and friable and hard to secure, and unavoidable obstruction is often caused by creeps and squeezes at the face of the work where the air is required to travel, but every possible effort is made to comply with the law. All the work is now confined to the north side. Coal three and one-half feet thick, and worked on the long-wall plan. Pay for mining, seventy-five cents per ton for unscreened coal. Employment is given to about 100 men. The product is consumed by the railroad company. Ten coal chutes having been erected at the mine to coal engines.

Interstate Coal Company—Wm. Walton, superintendent, and David Bowen, foreman. Mine located one and one-half miles south of Higbee, and connected with the M. K. & T. R. R. Shaft 110 feet deep; and equipped with first class machinery for hoisting. Ventilation is furnished by a twelve foot fan with satisfactory results. The ventilative current of air is divided into four separate currents and each current ventilates a separate group of miners. The air divides at the bottom of the fan shaft, the current traveling to the south side passing over an air crossing and then divided to the east and west, while the current on the north side is split at the bottom of the downcast, and the four currents are conducted around the face of the workings returning over the east and west entries to the upcast, after completing its work. I made the first inspection of this mine on the 31st of August, 1898, and found it in good condition with the ventilation up to the requirements of the law. January 24 I visited the mine again, and discovered that a connection had been made between the first west off

of the first north entry, with the east entry off of the third north, which had greatly improved the ventilation in that part of the mine; the air is now very satisfactory all over the mine. My third visit to the mine I found it closed, the men having suspended work out of sympathy for fellow miners in the states of Kansas, Arkansas, and Indian Territory. The mine is extensively and practically operated and gave employment to about 250 men. Coal three and one-half feet thick, worked on the long-wall plan, and pay seventy-five cents per ton for mining clean coal. A large portion of the product is consumed by the railroad company, chutes having been built at the mine to coal engines, and the balance of the output is shipped and consumed at local towns along the line of road.

HUNTSVILLE POSTOFFICE.

E. Edwards is operating a mine near Huntsville in fall and winter to supply local trade.

Hunt Bros. Mine located at Huntsville. It is entered by a drift and ventilated by a furnace. Coal four feet thick, and worked on the room and pillar plan. Seventy cents per ton is paid for mining screened coal. Most of the product is consumed in the surrounding country. Four men employed.

W. E. Mitchell operates a mine at Huntsville. It has a drift opening, and ventilation is furnished by a furnace and giving good results. Coal four feet thick, and worked on the room and pillar plan, and pay seventy cents per ton for mining screened coal. While this mine is located about a mile from a railroad, and is operated to supply home consumption, yet considerable of the coal is hauled in wagons, loaded on cars and shipped over the Wabash R. R. to local towns along the line. From four to eight men employed.

Jas. F. Robinson is operating a mine at Huntsville in the same locality as the last named mine, and on the same coal seam, and same method of mining used. This mine is also entered by a drift and a furnace furnishes the ventilation. The product is mostly consumed at Huntsville and vicinity. Four men employed.

John Lewis is operating a mine on the Stewart place. Mine entered by a drift and ventilated by a furnace. Mine only operating to supply local trade.

Wm. Vaughn is operating a mine east of Huntsville in winter to supply home trade.

MOBERLY POSTOFFICE.

John Cronan & Son. Mine located three miles west of Moberly. It is entered by a drift and ventilated by a furnace. Coal three and one-half feet thick, and worked on the room and pillar plan, and pay seventy cents per ton for mining clean coal. The product is taken away in wagons and consumed at Moberly and vicinity.

Harry Ward. Mine located two miles northwest of Moberly. Shaft ninety feet deep, and operated by horse power for hoisting. Ventilation is produced by a furnace. Coal four feet thick and worked on the room and pillar plan. It is taken away in wagons and consumed at Moberly.

D. W. Skinner operates a mine west of Moberly in the fall and winter to supply home demand.

D. T. Bradley. Mine located four miles southeast of Moberly. Shaft sixty feet deep; hoisting by horse power. Coal four feet thick, worked on the room and pillar plan, and ventilated by a furnace. Coal taken away in wagons, and consumed at Moberly and vicinity.

Eagle Coal Company. Mine located a mile west of Moberly, and has shipping connection with the Wabash R. R. Shaft 125 feet deep; and operated by steam power. Ventilation is furnished by a furnace with very poor results. I made first inspection on the nineteenth of August and discovered the ventilation deficient in every part of the mine, and instructions were given to clean and enlarge the air-ways. October 15 I visited the mine again, and found a new air course had been made and the ventilation was satisfactory. I inspected the mine again on the twenty-sixth of December, and found more men employed than the capacity of the furnace could supply air to, and the company was instructed to enlarge the furnace or reduce the number of men. I made another visit on the fifth of May, and discovered the machinery defective and ordered the mine closed until the same was made secure. Coal three and one-half feet thick, and worked on the double entry room and pillar plan. Seventy cents per ton is paid for mining clean coal. From thirty to forty men employed.

Jones & Davis Coal Company—David Davis, superintendent. This company owns and is operating four mines in this county, and all have shipping connection with the Wabash R. R. All the mines are working the same coal seam, and are under the same management.

Mine No. 1 1-2 is located two miles east of Huntsville. It is a shaft 100 feet deep, and operated by steam power. Ventilation is fur-

nished by a twelve foot fan. I made four visits to this mine during the past year, but only on the visit on the fourth of May was it in operation. I discovered on this visit that the south side was nearly worked out and new work had been opened out on the north side and the ventilation satisfactory. The mine had also changed hands, the former operators having failed, and I was informed leaving the employes without their wages. Coal four feet thick, and worked on the double entry room and pillar plan, and pay fifty cents per ton for mining unscreened coal. Fifty-five men employed.

Jones & Davis mine is located about half way between Moberly and Huntsville. This is also a shaft, and is equipped with good machinery for hoisting. The ventilation is furnished by a ten foot fan, which was producing plenty of air in the mine, but the current circulating around the south side was overloaded with work by having too many men working in the one current, and another split was ordered. I made three inspections of the mine during the year, viz.: August 19, October 14 and the 4th of May, and with the exception of the first visit, I found it in good condition with the ventilation up to the requirements of the law. Coal four feet thick, worked on double entry room and pillar plan, paying fifty cents per ton for mining unscreened coal. Shipping connection is made with Wabash R. R., and a large portion of the product is consumed by that company. About 100 men employed.

This company opened out two new mines during the past year about half a mile north of the railroad, and built a trestle from the railroad to the mine, and laid a tram-way, and the coal is hauled by machinery, a new tippie was also built, and revolving screens put in to separate and clean the coal. Both mines are drift openings, and the ventilation is furnished by the aid of furnaces. Coal four feet thick, and worked on the double entry room and pillar plan, paying fifty cents per ton for unscreened coal. The roof overlying the coal is a mixture of slate and soapstone which makes excellent roof and easily secured by timber. The mines are dry and roadways high. About seventy men employed at both of the mines.

There are several other mines operated in the fall and winter located at Jacksonville, Yates, Renick and Cairo, and all information concerning same will be found in the statistical table of this county.

RAY COUNTY.

Production, 252,683 tons.

Ray county is one of the large coal producing counties, and ranks sixth on the list of the coal producing counties of the state. While the

principal coal seam mined within the borders of Ray county is small in point of thickness as compared with some of the coal seams in other parts of the state, yet the quality of the coal, the nature of its roof and mining, the economic system of working it, and its short haul to market gives the operators of these mines such advantage over operators in other parts of the state where thicker seams of coal are mined as to be able to compete with them in the market. Eighteen inches is about the general thickness of the coal seam at all the mines along the banks of the Missouri river, but in the surroundings of Richmond the vein is from four to six inches thicker. The county this year produced 252,683 tons, which was sold at the mines for \$340,065 or an average of \$1.34 per ton. To produce this amount of coal 32 mines were operated and 740 men employed. The system upon which the mines of this county are operated is confined exclusively to the long-wall plan. A very important feature connected with mining may be observed in this county, and that is the absence of any record whatever of the use of powder. The importance we attach to this is not only the economical advantage of mining without the use of powder, but the great number of lives and limbs saved by its non-use; in proof of which it may be seen by reference to tables on accidents, that while the county stands sixth in the amount of coal produced, yet there has not been a fatal accident recorded against the county, in the operation of the mines, since I have been inspector, by either a fall of roof, coal, or by the use of powder. Her principal mines are located at Camden and Richmond while smaller mines are operated in other sections of the county to supply local demand. The product is shipped to market over the St. Joe. branch of the Santa Fe, and also over the Wabash Railway. Following is a description of the location and condition of her principal mines:

CAMDEN POSTOFFICE.

Jno. T. Butler. Mine located two miles east of Camden, and has shipping connection with the Santa Fe R. R. by a spur switch. Shaft fifty feet deep, and operated by steam power. Ventilation is produced by a furnace with very fair results. This is the mine formerly owned by Lusk & Lockwood, which was leased or bought by the present operator who has been operating it the past year. Coal eighteen inches thick, and worked on the long-wall plan, and paying seventy-five cents per ton for mining. About twenty men employed. The product is taken to Kansas City.

The Mosby Coal Company operates a mine at Camden in the fall and winter to supply local demand.

FLEMING POSTOFFICE.

Kansas & Texas Coal Company—B. F. Hobart, president, and D. Ramsey, superintendent, and Harry Wyatt, foreman. Mine located at Fleming and has shipping connection with the Wabash R. R. Shaft seventy feet deep, and equipped with first class machinery for hoisting. Ventilation is furnished by a twelve foot fan with excellent results. I visited the mine and made a thorough inspection on the thirteenth of October and found it in excellent condition with the ventilation double the amount required by law. The roadways are high, wide and clean, and are kept in good order. The safety appliances were also in good condition except the cages which I ordered replaced or repaired. I visited the mine again on the fifteenth of May, and found it closed, the men being on a strike against a reduction in the price of mining, hence no inspection made. Coal eighteen inches thick, and worked on the long-wall plan, and like all the other mines in Ray county, the movable face track is used. Mining is paid for at the rate of eighty-seven and one-half cents per ton, and employment is given to about seventy-five men. The product is shipped to Kansas City.

GEORGEVILLE POSTOFFICE.

The Climax mine is operated by W. H. Blunt. This is a shaft 160 feet deep, and hoisting by horse power. This is the same coal seam as that which is worked in other parts of this county, and method of mining is the same. The coal is consumed at Georgeville and surrounding country.

HARDIN POSTOFFICE.

There are several parties operating mines during the fall and winter in the surroundings of Hardin and Lakeview. The coal crops out at the foot of the bluffs and the mines are entered by drifts and ventilated by furnaces. Their output is small, and are only operated to supply home demand. Other information concerning same will be found in the statistical table.

KNOXVILLE POSTOFFICE.

The Grimes mine is operated by Jas. Blair. Shaft 190 feet deep, and operated by horse power. Coal twenty inches thick, and worked on the long-wall plan, using the movable face track. The product is consumed at Knoxville.

RICHMOND POSTOFFICE.

Richmond is noted for its large and valuable mines, and it is the great coal center of the northwest, mining is progressing in a very satisfactory manner at this place, and an enormous amount of coal is taken out every year within a radius of two miles. All the mines are working in the same coal seam which will average twenty-two inches in thickness. The coal is underlaid by a fire clay mining, and is overlaid by a strong rock roof well adapted for the longwall method of mining which is used here. The movable face track is used, and all the mines are fairly ventilated and practically operated.

Hayson & Humble Coal Company. Mine located at Richmond. Shaft eighty feet deep and hoisting by horse power. Mine operated to supply home trade.

Andrew Blair is operating a mine near the city to supply local demand.

Diamond Coal Mine. This mine is located at Richmond. Shaft eighty feet deep, and hoisting by a horse, the mine is only operated during the fall and winter, and the product is consumed in the vicinity. Twelve men employed.

Ottman & Swopes Coal Company. Mine located southeast of Richmond. Slope opening and ventilation is furnished by a furnace. Thickness of coal and mode of mining is the same at this mine as at all others in this locality. The product is consumed at home.

Chas. E. Crispin is now operating the old Diamond mine. This mine is located at Richmond. Shaft seventy-five feet deep, and hoisting by a horse. Coal consumed at Richmond.

The Daugherty mine was operated during the past year by Jno. W. McCart. Shaft sixty feet deep; hoisting by a horse, and ventilated by a furnace. Eighty-seven and one-half cents per ton paid for mining. From four to eight men employed. Coal consumed at Richmond.

Hubbell & Fisher Coal Company. Mine located west of Richmond, and known as No. 10. Shaft 110 feet deep; hoisting by horse power. Ventilation is produced by a furnace with excellent results. I made two inspections of this mine during the past year and found it in excellent condition on each inspection. Thickness of coal, mode of working and price paid for mining is the same as that of other mines in this county. Shipping connection with the Santa Fe R. R. Twenty-five men employed.

Pickering Coal Company. Mine located west of Richmond, and has shipping connection with the St. Joe Branch of the Santa Fe R. R. This is known as mine No. 11, and has an underground connection with mine No. 10, for an escapement. It is operated by a vertical shaft 110 feet deep and equipped with steam power for hoisting. Ventilation is furnished by a furnace with excellent results. Coal twenty-two inches thick, worked on the long-wall plan, paying eighty-seven and one-half cents per ton for mining clean coal. About thirty men employed.

Wilson Coal Company. Mine located at Richmond, and has shipping connection with the St. Joe Branch of the Santa Fe R. R. Shaft 110 feet deep; equipped with machinery for hoisting. Mine is ventilated by a furnace which is inadequate to ventilate it properly in its present condition. The mine has been in operation for a great number of years, and is very extensively worked. It has also been in litigation for a number of years, part of the time it remained idle and was greatly neglected, the bottom has heaved up and the constant settling of the roof has almost closed up the air-ways, thus the air is made to travel over small contracted air-ways with many bends and angles until the effective force of the furnace is lost on the air before it reaches the miners, the air-ways must be enlarged before the air can be satisfactory, as it is very much vitiated by black-damp as well as deficient in quantity. Thickness of coal, mode of working, and price paid for mining with all other conditions, the same as that of other mines in this locality. Thirty men employed.

A. F. Rankin. Mine located four miles east of Richmond, and has shipping connection with the St. Joe Branch of the Santa Fe R. R. Mine entered by a drift and ventilated by a furnace. Coal twenty-two inches thick, and worked on the longwall plan. Pay for mining at the rate of eighty-seven and one-half cents per ton. Thirty men employed. The product is shipped to St. Joe and Kansas City.

Mercantile Coal & Mining Company—John Griffith, foreman. Mine located at Richmond, and has shipping connection with the St. Joe Branch of the Santa Fe R. R. Shaft 115 feet deep, and equipped with machinery for hoisting. The mine is ventilated by a furnace. I made three inspections of this mine during the past year, first inspection was made on the tenth of October. I discovered on this visit that the furnace had been rebuilt and enlarged; this had increased its power and, necessarily the volume of air; but as the air was circulating around in one undivided current, it was very impure before it reached the men at work on the east side, and instructions were given to divide the air into two or more currents. I made

another inspection on the twenty-third of May, and discovered that my request had been complied with, and I found the ventilation very fair all over the mine. About the twentieth of June complaints were received at this office that the furnace was neglected and that the men were suffering for the want of air, and I visited the mine again on the twenty-seventh of June, and found the ventilation satisfactory. While I consider the furnace inadequate to furnish the required amount of air at all times in this mine, yet if regularly attended to and care taken to see that the doors are kept closed, the men will not suffer for want of air, but the greatest attention is required. Coal twenty-two inches thick, and worked on the longwall plan. Pay eighty-seven and one-half cents per ton for mining. About eighty men employed. The product is shipped and consumed at St. Joe.

Pence & Calnen Coal Company—Wm. Calnen, superintendent. Mine located one mile southeast of Richmond, and has shipping connection with the St. Joe Branch of the Santa Fe R. R. by a spur switch. Shaft eighty feet deep, and hoisting by horse power. The mine is ventilated by the aid of a furnace which was not giving satisfactory results. I made first inspection of this mine on the twelfth of October and found the ventilation weak and sluggish and instructions were given Mr. Calnen to build a furnace at this air shaft, instead of exhausting along the air chamber partitioned off at end of hoisting shaft, which was entirely too small in area. I made another inspection on the twenty-fourth of May and found a fire basket in the air shaft to aid the furnace. The air on this date was coming down the hoisting shaft, traveled over the west entry to its terminus where it was split to the north and south, the ventilation at this date was very satisfactory. I visited the mine again on the twenty-seventh of June and found it in very good condition. Preparations were made at this date to put in machinery to hoist in place of horse, the foundation was built, and the engine set, and the pit head and weigh-house was in course of construction. A ventilating fan will also be set here in place of the furnace. Thickness of coal, and mode of working is the same as at other mines in this locality. Eighty-seven and one-half cents per ton is paid for mining. About sixty men employed. The product is taken to St. Joe.

Richmond & Camden Coal Company—John Gibson, superintendent; Robt. Gibson, assistant. This company owns and is operating seven mines in this county and a large amount of coal is produced from each of the mines (except No. 12, which has not been operating during the past year) and employment given to a large number of men.

Two of the mines are located at Camden, while five are situated in the surroundings of Richmond. Each mine is worked on the long-wall system and very well ventilated. A movable face track is used at all the mines, and is a great convenience to the miner in loading his coal. The thickness of the coal at the Camden mines is about eighteen inches. It is overlaid by a draw slate ten inches thick, which comes down with the coal, and is used to build pack walls along the face and roadways to secure the roof, as no timber is used. The coal in the the mines in the surroundings of Richmond is about twenty-three inches thick, with a good strong roof over it.

Mines Nos. 1 and 2 are located one mile west of Camden, and have shipping connection with the Wabash and Santa Fe Railways. Both mines have shaft openings about the same depth and are equipped with good machinery for hoisting. I made the first inspection of these mines on the thirteenth of October, and found the ventilation better than on my last visit, but was still weak and deficient, however, on investigation I was informed that the company contemplated putting in a fan to replace the furnace, and that it would soon be on the ground. On the eighth of November, a letter was received at this office from one of the miners stating that no fan had been set and that the ventilation was very bad in mine No. 1, and requested me to visit the mine again. Having inspected the mines so recently and being so familiar with the general conditions, I considered another visit so early a waste of time; realizing, however, the fact that the furnace was inadequate and that nothing would better their condition but a fan, or a larger furnace, a letter was written the company requesting improvement in the ventilation at once, otherwise I would be forced to close the mine. In a few days Mr. Gibson kindly replied that my wishes would be promptly and strictly complied with, that a fan was then on the ground and that it would be set up at once. I visited the mine again on the fifteenth of May, found the fan set, making only forty-five revolutions per minute and furnishing double the amount of air required by law, indeed, more than would be comfortable for the men to work in. On entering mine No. 1, at this visit I met some of the miners coming out at noon, and they praised the air very much, saying that it was foolishness for me to go to the face of the workings, that the air was all right, which I found to be true on examining it. The fan is set at mine No. 2, and as an underground connection is being made between the two mines the same fan will furnish air for both. The current that ventilates No. 1 comes down through the hoisting shaft, travels over the north entry and along the face of the workings to the upcast. Both mines give employment to

about eighty men. A large portion of the product is consumed by the railroad company. Chutes having been erected at Mine No. 1 to coal engines.

Mines Nos. 3, 4 and 5 are located from one to one and a half miles south of Richmond, and have shipping connection with the St. Joe Branch of the Santa Fe R. R. These three mines have shaft openings, and are equipped with good machinery for hoisting. They are connected by an underground traveling way, which acts as an avenue of escape in case of an accident at either of the mines. The three mines are ventilated by the same fan which is set on top of mine No. 5 and forcing the air into the mines.

Mine No. 3 is a shaft fifty-five feet deep, and equipped with good machinery for hoisting. I made inspection of it on the twelfth of October, and found the ventilation satisfactory, but the mine was very wet and making lots of water. On the twenty-fourth of May I visited the mine again and discovered that the rails and pit cars had been taken out, and that the mine had been abandoned.

Mine No. 4 is located about one-fourth of a mile north of No. 3. It has a shaft opening, and equipped with machinery for hoisting. Inspection of this mine was made at same time I inspected mine No. 3, and found the ventilation very satisfactory. I also discovered on my second visit that considerable improvement had been made in the roadways. The ditches had been cleaned, and made to carry and hold water in place of dirt. I also noticed that the roadways had been drained and cleaned and that they were in better condition than they had been for years, and yet there is room for more improvement. It would be of great benefit to the mine and money saved to the company, if it would hire a competent man to look closely after the underground work of its numerous mines. The mines of Ray county are easily managed but yet they require the constant care and attention of a practical man to keep them in proper condition. The mines of this company plainly indicate great neglect of late years. Thickness of coal, mode of working, and price paid for mining is the same as that at other mines in this vicinity. About eighty men employed.

Mine No. 5 is a shaft seventy-five feet deep, and equipped with good machinery for hoisting. The same description of the underground workings applies here as that given for No. 4. I found the ventilation satisfactory at both inspections, and the mine otherwise was in good condition. The product of these mines is taken to St. Joe market, but the railroad company consumes a large portion of it. About seventy men employed.

Mine No. 9. This mine is located on the west side of Richmond, and has shipping connection with the St. Joe Branch of the Santa Fe R. R. Shaft 100 feet deep, and the only mine operated by this company where hoisting is done by a horse. Ventilation is produced by a furnace, and the mine is well provided for in this respect. I found the ventilation satisfactory at dates of both inspections and the mine otherwise in good condition. Thickness of coal and mode of working is the same here as all the other mines in the surroundings of Richmond. Eighty-seven and one-half cents per ton is paid for mining. Thirty men employed.

Mine No. 12 is located one and one-half miles northwest of Richmond, and has shipping connection with the St. Joe Branch of the Santa Fe R. R. This is also a steam plant and well equipped mine, but owing to low and faulty coal very little work was done last year.

SWANWICK POSTOFFICE.

Williams Coal Company—J. R. Williams, manager. Mine located at Swanwick, and connected with the St. Joe Branch of the Santa Fe R. R. Shaft 107 feet deep; hoisting by horse power. Ventilation is furnished by a furnace with very fair results. An underground traveling way is kept open for an avenue of escape between this and the old mine. The coal at this mine is not so thick as that at the Richmond mines, and is rather faulty; the same price is paid for mining as at other mines. Twenty-five men employed. The coal is shipped to points north.

ST. CLAIR COUNTY.

Production, 4,210 tons.

While the greatest portion of St. Clair county is underlaid by the coal measure formation, yet very little mining is carried on in the county. There are several local mines operated at Appleton City in the fall and winter to supply the local demand. The thickness of the coal in this vicinity is about twenty-two inches, and is overlaid by black slate. There are a number of local mines also at Johnson City, Osceola and Lowry City, but the mines are all small, and the output limited. Names of parties operating mines in this county, with all other information concerning same will be found in the statistical table of this county.

SALINE COUNTY.

Production, 1,320 tons.

Coal underlies over half of Saline county, but coal mining is prosecuted only on a small scale, and the county can hardly be classed as a coal producer. The few mines that are operated are small and scattered, their production is very small, and are only worked in fall and winter to supply the local demand. All other information concerning the mines will be found in the statistical table.

SCHUYLER COUNTY.

There is but very little mining done in Schuyler county, although there are two workable veins of coal extending over a large portion of the county. About two miles southwest of Zola, there are several mines operating along the banks of the Chariton river, the coal crops out in the hills, and the mines are entered by drifts. The Bradburn mine is a shaft twenty-eight feet deep. The coal at this mine is about forty inches thick, but occasionally a clay seam or horse back divides the coal, but productive mines could be easily operated here if there was better shipping facilities. All information concerning the output of coal in this county will be found in the statistical table in this report.

VERNON COUNTY.

Production, 298,382 tons.

Vernon county ranks well up among the large coal producing counties of the state. The principal mines are located at Panama in the northern part of the county. During the past year the output of coal amounted to 298,382 tons, for which 98 cents per ton was received at the mines, making the value of the product \$295,271. There were 20 mines operated, employing 448 miners during the winter and 392 miners in the summer season. Following will be found a detailed description of the more important mines, and their condition at dates of inspection.

ARTHUR POSTOFFICE.

Arthur Coal Company—Frank Williams, superintendent. Mine located one and one-half mile north of Arthur, and has shipping con-

nection with the Mo. P. R. R. The mine is entered by a drift, and ventilated by a furnace which is giving good satisfaction. This mine was opened out from the bottom of a strip-pit, after the covering over the coal got to be too thick to continue the stripping with profit. The coal is nearly five feet in thickness, and is overlaid with black slate which makes good roof, and easily secured by timbering. The double entry room and pillar method of mining is used, and fifty cents per ton paid for mining run of mine coal. Employment is given to about forty men. The product is shipped to Kansas City and other points.

CARBON CENTER POSTOFFICE.

There are a few mines operating in the vicinity of Carbon Center during the winter to supply local trade.

HARWOOD POSTOFFICE.

Mayberry & Company—Geo. Collett, Ed. Dunn and others are operating mines in the surroundings of Harwood during the fall and winter to supply the home demand. The coal seam in this locality is about thirty inches in thickness, and of very fine quality for domestic purposes. The mines are entered by drifts and ventilated by furnaces.

KANSAS CITY POSTOFFICE.

Central Coal & Coke Company—John Perry, general manager; David Mackie, general superintendent, and John H. Williams, foreman. This company is now opening a new mine one and one-half miles north of Arthur, having abandoned mine No. 9, the equipment from which was taken down and moved over to the new mine which will be equipped with all the modern improvements. I visited the prospective mine on the twelfth of April, and found the shaft down about sixty feet, the sinking was being pushed with good speed, and I have been informed since that coal was struck at 100 feet in depth and that the mine was now in operation.

KETTERMAN POSTOFFICE.

There are several parties operating strip mines in the surroundings of Ketterman in the fall and winter to supply local trade.

MOUNDVILLE POSTOFFICE.

Coal is found in the hill tops in the surroundings of Moundville, and mines are opened by drifting. The output of these mines is

small and they are only operated during the fall and winter to supply local demand. Thickness of coal and output of mine will be found in the statistical table.

PANAMA POSTOFFICE.

Bedford Coal Company. Mine located at Panama, and has shipping connection with the Mo. P. R. R. Shaft fifty feet deep, and equipped with very good machinery for hoisting. Ventilation produced by a ten foot fan. I made two inspections of the mine during the past year, and found it in a deplorable condition with water knee deep, and a deficiency in the ventilation. On my last visit, April 11th, I ordered the mine closed. Coal three feet thick, and worked on the room and pillar plan. Thirty men employed.

RICH HILL POSTOFFICE.

Vernon Coal Company—J. M. Wise, superintendent, and Sid Haynes, foreman. Mine located at Panama, and has shipping connection with the Missouri Pacific R. R. by a spur switch. Mine entered by a slope and ventilated by a fan. I made a careful inspection of this mine on the seventeenth of October, and discovered that all the work was confined to the north entry, and ventilation satisfactory. On the eleventh of April I visited the mine again and found the air satisfactory and the mine otherwise in very fair condition. Coal four feet thick, and worked on the double entry room and pillar plan, paying fifty cents per ton for mining unscreened coal. About fifty men employed.

Rich Hill Coal Company. This company owns and is operating two mines in this county, and both have shipping connection with the Mo. P. R. R. Both mines have shaft openings, and are under the same management as the mines of Bates county. W. B. Williams, superintendent.

Mine No. 17—John Daly, foreman. Mine located at Panama. Shaft 125 feet deep; equipped with first class machinery for hoisting. On my visits to this mine during the past year I found the work confined to drawing back pillars, and before this report reaches its readers the mine will have been abandoned.

Mine No. 21—Wm. Gresham, foreman. Mine located one mile east of Panama. Shaft eighty-seven feet deep, and equipped with first class machinery for hoisting, draining and ventilating. I made my first inspection of this mine on the eighteenth of October, and found the ventilation double the amount required by law and the mine in excellent condition. An escapment shaft had been sunk and arranged

in two compartments, a stairway had been erected in one compartment for the men to travel in case of an accident to hoisting shaft, and a twelve foot fan set on top of the other to furnish ventilation for the mine. I found the ventilation good at all my other visits and the mine in good condition. The roadways are high, dry and clean and the airways high, wide and roomy. The mine is operated on the double entry room and pillar plan, but the coal is low at places and faulty. The same price is paid for mining at this mine as that at the other mines of this company in same locality. About 100 men employed.

WALKER POSTOFFICE.

There are several parties operating strip mines in the surrounding of Walker in the fall and winter to supply local trade. Names of parties and output of mines with all other information will be found in the statistical table of Vernon county.



*TABLE VIII—Showing by Counties the Plant, Employes, Tonnage
Ending June*

Counties.	Kind of opening.				No. mines operated....	Kind of power.				How ventilated.			Mode of working.	
	Shaft.....	Slope.....	Drift.....	Strip-plt..		Steam.....	Horse.....	Hand.....	Electricity.	Natural....	Furnace...	Fan.....	Long-wall.	Pillar and room....
Adair.....	3		4		7	2	4	1		1	4	2	3	4
Audrain.....	10	1			11	4	6	1		4	5	2	7	4
Barton.....	2	9	5	8	24	1	7	16		21	2	1		16
Bates.....	6	12	2	13	33	4	15	1		10	6	4	1	19
Boone.....	4	2	3	6	15	1	3	5		5	4		2	7
Caldwell.....	1				1	1						1		
Callaway.....	3		4		7	1	2	4		2	4	1	6	1
Carroll.....	1	1	2	2	6		1	3		3	1			4
Cass.....	1				1	1						1		1
Cedar.....			7	3	10			7		6	1		1	7
Chariton.....	2	2	4	2	10		3	5		7	1		1	7
Clay.....	1				1	1						1		
Cole.....	3				3	1	2			3				3
Cooper.....			1		1			1		1				1
Dade.....	1	4	3		8		1	7		8				8
Grundy.....	2				2	2				1		1	2	
Henry.....	15	5		11	31	4	15	1		3	15	2		18
Howard.....			1		1			1		1				
Jackson.....	1				1	1						1	1	
Johnson.....	1	5	2	1	9	2		6		7	1		1	7
Lafayette.....	25	7	20		52	11	21	19	1	15	30	7	50	2
Linn.....	6				6	3	3				5	1	6	
Livingston.....	1				1		1				1			1
Macon.....	12	1	1		14	9	3	2		2	3	9	1	13
Monroe.....			3		3			3		3			2	1
Montgomery.....	2				2									
Nodaway.....	3				3		3			2	1		1	2
Pettis.....	1				1	1								1
Putnam.....	4	1	3		8	3	3	2		3	3	2		8
Ralls.....	2		1		3		2	1		1	2		3	
Randolph.....	10	4	6		20	8	10	2		3	11	6	3	17
Ray.....	20	1	11		32	11	12	9		12	17	3	32	
St. Clair.....	3	2	3	6	14		2	7		9				9
Saline.....	1	2	1		4		2	12		4			3	1
Schuyler.....	2		1		3		1			2	1			3
Vernon.....	5	6	2	8	21	5	5	3		5	3	5		13
Totals.....	154	65	90	60	369	77	130	110	1	147	121	50	132	178

and Value of Output of the Missouri Coal Mines for the Fiscal Year 30, 1899.

Powder.		No. mules worked.		Employees.						Tons of coal mined in each county.....	Average price per ton received at mines...	Total amt. received for the output.....	Casualties.	
No. of kegs used.....	Cost.....	Winter....	Summer....	Miners.		Day & outside men.		Totals.					Fatal	Non-fatal..
				Winter....	Summer....	Winter....	Summer....	Winter....	Summer....					
1,915	\$3,882 00	17	16	264	242	39	37	303	279	104,868	\$1 04	\$109,767	.....	.....
55	107 65	7	7	113	87	30	26	143	113	40,759	1 21½	49,592	.....	.....
3,114	6,228 50	9	8	132	120	37	33	169	153	67,844	1 04	70,863	1	.....
18,404	37,149 95	74	72	545	496	207	193	752	689	441,983	90½	403,033	3	3
358	731 20	1	1	68	28	19	14	85	40	29,665	1 33	39,634	.....	.....
.....	.....	3	2	150	80	15	12	165	92	28,000	1 60	45,000	.....	.....
.....	.....	.....	.....	61	29	10	8	71	37	22,356	1 38	30,939	.....	.....
.....	.....	.....	.....	10	2	7	3	17	5	2,397	1 90	4,564	.....	.....
80	160 00	1	.....	3	.....	.....	.....	5	.....	1,321	1 38	1,797	.....	.....
.....	.....	.....	.....	9	8	5	3	14	11	2,116	1 40	2,972	.....	.....
.....	.....	1	1	27	7	7	2	34	9	4,517	1 80	7,928	.....	.....
.....	.....	.....	.....	20	12	5	5	25	17	8,000	1 75	14,000	.....	.....
.....	.....	.....	.....	14	14	6	6	20	20	8,600	1 32	11,350	.....	.....
.....	.....	.....	.....	2	.....	.....	.....	2	.....	320	1 50	480	.....	.....
.....	.....	.....	.....	30	14	2	1	32	15	4,930	1 40	6,910	.....	.....
.....	.....	7	5	172	141	25	23	197	164	39,633	1 73	68,543	.....	.....
2,594	5,202 00	7	7	248	191	77	47	325	238	81,873	1 45	114,358	.....	.....
.....	.....	.....	.....	4	.....	.....	.....	4	.....	456	1 85	842	.....	.....
.....	.....	3	3	100	65	18	14	118	79	25,125	2 10	52,763	.....	.....
21	42 25	.....	.....	29	7	5	1	34	8	4,710	1 32	6,231	.....	.....
.....	.....	62	44	1,284	588	211	164	7,495	752	392,068	1 38	544,179	1	1
.....	.....	.....	.....	263	191	21	17	284	208	72,081	1 48	107,312	1	3
.....	.....	.....	.....	6	3	2	1	8	4	800	2 00	1,600	.....	.....
20,769	42,005 00	119	113	1,270	1,189	396	366	1,666	1,555	739,293	97	723,132	4	11
3	7 50	.....	.....	6	2	.....	.....	6	2	960	1 37	1,315	.....	.....
8	14 00	.....	.....	8	3	1	.....	9	3	2,670	1 48	3,945	.....	.....
.....	.....	.....	.....	14	4	4	2	18	6	2,350	2 35	5,575	.....	.....
.....	.....	.....	.....	8	5	2	2	10	7	3,200	1 75	5,600	.....	.....
.....	.....	19	14	358	298	70	55	428	353	128,673	1 07	138,507	.....	2
.....	.....	2	2	49	48	10	9	59	57	16,014	1 23	19,765	.....	.....
5,320	10,614 90	57	54	760	711	139	153	899	864	354,830	96	341,252	4	2
.....	.....	28	23	792	513	105	71	897	584	252,683	1 34½	340,065	.....	.....
31	54 65	.....	.....	23	1	14	14	37	15	4,210	1 51	6,392	.....	.....
4	8 00	.....	.....	11	7	.....	.....	11	7	1,320	1 97	2,600	.....	.....
.....	.....	1	.....	15	.....	1	.....	16	.....	5,304	1 14	6,035	.....	.....
14,068	28,050 74	47	44	329	289	119	103	448	392	298,382	98	295,271	.....	1
66,714	133,436 44	465	416	7,195	5,393	1,611	1,385	8,806	6,778	3,391,811	1 12	3,582,111	14	23

TABLE IX—Showing, by counties, kind and number of coal mines of men employed, prices paid and received, total output of coal amount received for the product.

ADAIR

Office number.....	Name of company or mine owner.	Operator.	No. of days worked...	Kind of opening			Depth of shaft.....	Thickness of coal... Feet.....	Kind of power.			How ventilated.
				Slope.....	Drift.....	Shed-pit.....			Steam.....	Horse.....	Electricity.....	
1	American Fuel Co.....	American Fuel Co.....	240	1	1	1	50	3 6	1	1	1	1
2	Chas. Malwald.....	Chas. Malwald.....	80	1	1	1	50	3 6	1	1	1	1
3	Rombauer Coal Co.....	Rombauer Coal Co.....	186	1	1	1	50	3 6	1	1	1	10
4	D. O. Scott.....	D. O. Scott.....	160	1	1	1	50	3 6	1	1	1	1
5	Stroup, J. F. & F. A.....	J. F. & F. A. Stroup.....	252	1	1	1	50	3 6	1	1	1	1
6	The North Missouri Coal Co.	The North Mo. Coal Co.....	60	1	1	1	50	3 6	1	1	1	1
7	Watson Coal Co., Mine No. 3	Watson Coal Co.....	240	1	1	1	80	4 6	1	1	1	10
Totals.....			1,218	3	4	1	1	1	2	4	1	1 4 2

AUDRAIN

1	Farber Coal Co.....	Lawder & Peterson.....	236	1	1	1	104	2 5	1	1	1	1
2	G. F. Fisher.....	G. F. Fisher.....	105	1	1	1	40	2 6	1	1	1	1
3	Hafner, O. F.....	O. F. Hafner.....	215	1	1	1	50	2 6	1	1	1	1
4	Laddonia Coal Co.....	A. W. Judy.....	250	1	1	1	55	2 6	1	1	1	1
5	McGuire, Mrs. Martha.....	M. B. McGuire.....	200	1	1	1	28	2 6	1	1	1	1
6	Carr, Paris.....	Paris Carr.....	180	1	1	1	18	3 6	1	1	1	1
7	Standard Coal Co.....	Hanegar, Thomas and Detienne.....	100	1	1	1	65	2 6	1	1	1	1
8	Taylor, W. F.....	Oscar Krieger.....	250	1	1	1	110	2 8	1	1	1	1
9	Vandalia Coal & Brick Plant	Vandalia C. & B. Plant.....	90	1	1	1	65	4 1	1	1	1	8
10	Vandalia Coal Mine.....	Vandalia Coal Co.....	250	1	1	1	75	4 1	1	1	1	10
11	Wellsville Coal Co.....	Wellsville Coal Co.....	130	1	1	1	85	2 6	1	1	1	1
Totals.....			2,006	10	1	1	1	1	4	6	1	4 5 2

BOONE

1	Carter Bros. Coal Co.....	Carter Bros. C. Co.....	205	1	1	1	85	3 3	1	1	1	1
2	Columbia Coal Co.....	R. E. Heney.....	200	1	1	1	110	2 6	1	1	1	1
3	Gordon Scott.....	S. D. Gordon.....	252	1	1	1	55	3 3	1	1	1	1
4	Hord, T. B.....	T. B. Hord.....	24	1	1	1	3	3 6	1	1	1	1
5	Keene, Jas. H.....	Jas. H. Keene.....	240	1	1	1	127	3 4	1	1	1	1
6	Long, Thomas.....	Thomas Long.....	90	1	1	1	3	3 6	1	1	1	1
7	McKenzie, Robt.....	Robt. McKenzie.....	15	1	1	1	3	3 6	1	1	1	1
8	McKenzie, Mrs. Lydia A.....	N. B. McKenzie.....	18	1	1	1	3	3 6	1	1	1	1
9	Rees, Thos.....	Thos. Rees.....	75	1	1	1	2	4 4	1	1	1	1
10	Sims, J. S.....	J. S. Sims.....	18	1	1	1	4	4	1	1	1	1
11	Stidham, W. A.....	W. A. Stidham.....	30	1	1	1	3	10	1	1	1	1
12	Stone, Jas. W.....	Jas. W. Stone.....	10	1	1	1	2	4	1	1	1	1
13	White, Wm. & J. H. S.....	J. H. White.....	120	1	1	1	3	10	1	1	1	1
14	Whitmarsh, Chancey.....	C. Whitmarsh.....	20	1	1	1	4	1	1	1	1	1
15	Zaring mine.....	Sidney Creed.....	52	1	1	1	3	1	1	1	1	1
Totals.....			1,367	4	2	3	6	1	1	3	5	5 4

operated, the method or plan of working the same, kind of plant, number from the respective mines for the year ending June 30, 1899, and

COUNTY.

Pillar and room, Long-wall,.....	Amount and cost of powder.		Mules worked.	Employees.				Price paid for mining.		Tons of coal mined....	Price paid per ton at mines.....	Amt received for total output, year ending June 30, 1899.....	Office number.....			
				Miners		Others								Total.		
	No. of kegs	Cost.....		Summer....	Winter....	Summer....	Winter....	Summer....	Winter....							
1 ..	.....	.....	2	8	100	100	14	14	114	114	70	70	40,000	\$1 10	\$44,400	1
1 ..	.....	.....	2	8	100	100	14	14	114	114	75	75	200	1 25	250	2
1 1	1,655	\$3,310 00	4	3	100	75	10	8	110	83	55	55	30,408	1 00	30,408	3
1 1	.....	.....	1	1	10	10	2	2	12	12	75	75	2,500	1 00	2,500	4
1 1	.....	.....	1	1	12	12	3	3	15	15	70	70	5,000	1 15	5,750	5
1 1	.....	.....	1	1	5	5	.....	.....	5	5	75	75	600	1 25	750	6
1 1	290	572 00	4	4	40	40	10	10	50	50	55	55	25,160	98	25,709	7
3 4	1,915	3,882 00	17	16	264	242	30	37	303	279	.....	.....	104,868	1 04	109,707	.....

COUNTY.

1	.....	.....	1	1	15	8	3	2	18	10	\$ 70	\$ 70	3,900	\$1 40	\$5,460	1
1	.....	.....	1	1	3	.....	1	.....	4	.....	90	90	320	1 75	560	2
1	9	\$16 65	.....	.....	2	19	1	1	3	3	80	80	415	1 50	623	3
1	.....	.....	.....	.....	6	19	1	1	7	3	90	90	1,368	1 75	2,394	4
1	.....	.....	.....	.....	3	19	1	1	4	3	75	75	400	1 25	500	5
1	4	7 00	.....	.....	3	3	1	1	4	4	75	75	1,500	1 25	1,875	6
1	.....	.....	.....	.....	6	4	2	1	8	5	80	80	600	1 70	1,020	7
1	30	60 00	1	1	20	16	6	5	26	21	70	70	6,000	1 13	6,800	8
1	.....	.....	1	1	11	11	4	4	15	15	70	70	1,980	1 20	2,370	9
1	.....	.....	3	3	40	35	10	10	50	45	70	70	23,551	1 15	27,084	10
1	12	24 00	1	1	4	4	.....	.....	4	4	75	75	725	1 25	906	11
7 4	55	107 65	7	7	113	87	30	26	143	113	.....	.....	40,759	1 21 3/4	49,502	.....

COUNTY.

1	60	\$126 00	1	1	15	8	3	2	17	4	\$ 75	\$ 70	3,850	\$1 25	\$4,813	1
1	.....	.....	1	1	8	8	.....	.....	12	12	60	60	3,200	1 05	3,390	2
1	200	400 00	1	1	20	10	3	1	23	11	75	75	15,000	1 50	22,500	3
1	2	4 00	.....	.....	2	.....	.....	.....	2	.....	75	75	100	1 25	125	4
1	92	193 20	.....	.....	14	5	.....	.....	16	6	70	70	6,000	1 20	7,200	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200	1 00	200	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	1 00	90	7
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	1 00	100	8
1	3	6 00	.....	.....	2	.....	.....	.....	.....	.....	75	75	225	1 00	225	9
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48	1 00	48	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	1 00	80	11
1	1	2 00	.....	.....	.....	.....	.....	.....	3	3	.....	.....	30	1 00	30	12
1	.....	.....	.....	.....	3	.....	.....	.....	3	.....	.....	.....	480	1 00	480	13
1	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	72	2 00	144	14
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	190	1 25	239	15
2 7	358	731 20	1	1	66	26	19	14	85	40	.....	.....	29,665	1 33	39,634	.....

STATISTICS OF

CALDWELL

Office number.....	Name of company or mine owner.	Operator.	No. of days worked....	Kind of opening		Depth of shaft.....	Thickness of coal.. Feet.....	Kind of power.	How ventilated.	Fan-diam ..
				Shaft.....	Slope.....					
				Strip-pit.....	Drift.....		Inches.....	Steam.....	Hand.....	Electricity..
1	Caldwell Coal Co.....	Caldwell Coal Co.....	257	1	...	527	1 8 1	...	...	10

CALLAWAY

1	Castle, Wm.....	Wm. Castle.....	249	...	1	...	2 4	...	1	...
2	Fulton Fire-brick & M. Co.	F. F.-B. & Mining Co....	210	1	...	110	2 2 6	1	...	5
3	Harris, John.....	John Harris.....	252	1	...	40	3 6	1	...	1
4	King, John G.....	John G. King.....	215	1	...	23	3 6	1	...	1
5	Morsenkopt, Jno.....	Jno. Morsenkopt.....	180	...	1	...	2 4	...	1	...
6	Smith Mine.....	J. Wm. Simmons.....	200	...	1	...	2 2	...	1	...
7	Smith, Jas.....	Jas. Smith.....	220	...	1	...	2 8	...	1	...
Totals			1,526	3	4	...	1 2 4	...	2 4	1

CARROLL

1	Cunningham Mine.....	J. B. & M. E. Cunningham	105	...	1	...	2 6	...	1	...
2	Hughes, Wm.....	W. J. White.....	57	...	1	...	2 2	...	...	...
3	Klondyke Mining Co.....	H. D. Anwater.....	60	...	1	...	1 6	...	1	...
4	Ogle, W. F.....	W. F. Ogle.....	49	...	1	...	1 10	...	...	...
5	Scott, Wilson.....	Chas. Ducate.....	180	1	...	26	1 10	1	...	1
6	Whitehead, Jas.....	Chas. Frost.....	20	1	...	...	1 8	...	1	...
Totals			471	1	1	2	...	1 3	...	3 1

CASS

1	Crelighton Coal Co.....	Geo. Meidinger.....	137	1	...	156	2 9 1	8
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CEDAR

1	Bouker, Nellie.....	Edward Beebe.....	17	...	1	...	1 6
2	Conner, Jas.....	Jas. Conner.....	82	...	1	...	2 2	...	1	...
3	Dial, Mrs. Jane.....	Deal & Conner.....	60	...	1	...	2 2	...	1	...
4	Duncan, J. C.....	J. C. Duncan.....	42	...	1	...	2	...	1	...
5	Floyd, J. N.....	J. N. Floyd.....	96	...	1	...	1 10	...	...	...
6	Lloyd, Mrs. R. A.....	N. D. W. Lloyd.....	90	...	1	...	1 6	...	1	...
7	McLeod, J.....	Intermill & Bridgewater	60	...	1	...	2	...	1	...
8	Poague Mine.....	G. M. Poague.....	90	...	1	...	2 4	...	1	...
9	Schroeder, C. M.....	C. M. Schroeder.....	80	...	1	...	1 8	...	...	...
10	Tilley Mine.0.....	J. H. Young.....	60	...	1	...	3	...	1	...
Totals			639	...	7	3	...	...	7	6 1

COAL MINES—Continued.

COUNTY.

Office number.....	Amt received for total output year ending June 30, 1890	Price paid per ton at mines.....	Tons of coal mined....	Price paid for mining.		Employees.			Amount and cost of powder.	Pillar and room, Long-wall.....						
						Total.	Others	Miners								
				Summer....	Winter....						Summer....	Winter....	Summer....	Winter....		
1	\$45,000	\$1 60	28,000	\$1 00	\$1 12½	92	165	12	15	80	150	2	3	1

COUNTY.

1.....					8	3	1	1	9	4	\$ 94	\$ 87	2,380	\$1 25	\$2,975	1
1.....					20	10	3	2	23	12	87½	87½	8,500	1 30	11,000	2
1.....					10	6	1	1	11	7	95	85	3,600	1 37½	4,950	3
1.....					6	2	2	1	8	3	93½	93½	3,050	1 50	4,575	4
1.....					3	2	1	1	4	4	1 00	1 00	600	1 50	900	5
1.....					6	2	1	1	7	4	1 00	87½	1,746	1 50	2,619	6
1.....					6	2	1	1	9	3	81	81	2,480	1 62½	3,918	7
6 1.....					61	29	10	8	71	37	.....	.....	22,356	1 38	30,937	

COUNTY.

1.....					2		1		3				231	\$1 75	\$405	1
1.....							2		2				189	1 75	332	2
1.....					2				2		\$1 25		150	1 75	263	3
1.....							3		3				280	1 75	490	4
1.....					6	2	1	1	7	3	1 25	\$1 25	1,467	2 00	2,934	5
1.....								2	2			1 25	90	1 75	140	6
4.....					10	2	7	3	17	5	2,397	1 90	4,564	

COUNTY.

1.....	80	\$160 00	1	3	2	5	\$ 60	1,321	\$1 36	\$1,797	1
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COUNTY.

1.....					2		2		4				50	\$1 50	\$ 75	1
1.....					2				2		\$1 00		240	1 50	360	2
1.....					2				3		93		120	1 50	180	3
1.....					2		1		3		1 00		136	1 25	170	4
1.....						3			3				450	1 50	675	5
1.....					2				3		1 00		135	1 25	169	6
1.....					2				3		1 00		185	1 25	231	7
1.....					2				3		1 00		200	1 37½	275	8
1.....						2			3				350	1 50	525	9
1.....					3				3		75		250	1 25	312	10
7.....					9	8	5	3	14	11	.....	.....	2,116	1 40	2,972	

STATISTICS OF

CHARITON

Office number.....	Name of company or mine owner.	Operator.	No. of days worked...	Kind of opening			Depth of shaft	Thickness of coal .. Feet.....	Kind of power.	How ventilated.		
				Shaft.....	Slope.....	Drift.....				Electricity.	Natural.....	Fan-therm.....
1	Applegate, L. L.....	L. M. Finnell	120	1	1	1	1	6	1	1	1	1
2	Benecke, L.	C. H. Owen.....	42	1	1	1	1	4	1	1	1	1
3	Buffington, F. P.....	F. P. Buffington.....	40	1	1	1	1	1	1	1	1	1
4	Cooley, J. M.....	J. M. Cooley.....	50	1	1	1	1	2	1	1	1	1
5	Harr, J. L.....	J. L. Harr.....	60	1	1	1	1	1	1	1	1	1
6	Huentin, John.....	Robt. Bruer.....	60	1	1	1	1	1	1	1	1	1
7	Isle, R. W.....	R. W. Isle.....	10	1	1	1	1	1	1	1	1	1
8	Kahler, V.....	V. Kahler.....	23	1	1	1	1	6	1	1	1	1
9	Kennedy, J. W.....	J. W. Kennedy.....	168	1	1	1	30	1	1	1	1	1
10	Wacter, Henry.....	Briggs & O'Donnell.....	1	1	1	1	57	6	1	1	1	1
	Totals	573	2	2	4	2	1	3	5	7	1

CLAY

1	Missouri City Coal Co.....	Missouri City Coal Co...	270	1	1	1	1	165	110	1	1	1
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COLE

1	Kauffman & Robben	Kauffman & Robben....	255	1	1	1	60	5	8	1	1	1
2	Knernscheid & Son.....	Knernscheid & Son.....	200	1	1	1	65	50	1	1	1	1
3	Leonard Mine.....	Abe Schull	250	1	1	1	30	18	1	1	1	1
	Totals .....	.....	705	3	3	3	1	1	2	3	3	3

COAL MINES—Continued.

COUNTY.

Office number.....	Am't received for total output year ending June 30, 1899.....	Price paid per ton at mines.....	Tons of coal mined....	Price paid for mining.		Employees.			Mules worked.	Amount and cost of powder.	Pillar and room.....
				Summer... Winter....	Summer... Winter....	Total.	Others	Miners			
1	\$560	\$1 75	320	\$1 25	2	2	2	55		1	1
2	228	2 00	114	1 25		2	2	55		1	1
3	224	1 40	160	1 00			4	55		1	1
4	180	1 50	120	1 00			4	55		1	1
5	810	2 25	360	1 00			4	55		1	1
6	350	2 00	175	1 00			4	55		1	1
7	72	36 00	36				4	55		1	1
8	224	2 00	112				4	55		1	1
9	400	2 00	1,300	1 25	1 00	4	3	5	3	1	1
10	2,880	1 50	1,920	1 00	1 00	3	2	6	2	1	1
	7,928	1 80	4,517			9	34	27	7	7	1

COUNTY.

1			1	1	20	12	5	5	25	17	\$ 87½	\$ 87½	8,000	\$1 75	\$14,000	1
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COUNTY.

1				8	8	4	4	12	12	\$1 10	\$1 10	4,000	\$1 50	\$6,000	1
1				12	12	1	1	3	3	1 10	1 10	3,000	1 25	3,750	2
1				4	4	1	1	5	5	37½	37½	1,600	1 00	1,600	3
3				14	14	6	6	20	20			8,600	1 32	11,350	

STATISTICS OF

BARTON

Office number.....	Name of company, mine or mine owner.	Name of operator.	No. days worked	Kind of opening			Depth of shaft.....	Thickness of coal... Feet.....	Kind of power.			How ventilated.	
				Shaft.....	Slope.....	Scarp pit.....			Drift.....	Steam.....	Horse.....	Hand.....	Electricity.....	Fan-diam. Furnace..... Natural.....
1	Adams, T. R. B.	Klizer & Brown.....	110	1	1	1	2	6	1	1	1	1	
2	Bell, J. W.	Tarbin, Mann & Stits....	60	1	1	1	1	12	1	1	1	1	
3	Betz, John.....	John Betz.....	30	1	1	1	2	4	1	1	1	1	
4	Boulware Bros.....	John H. Lavery.....	156	1	1	1	2	4	1	1	1	1	
5	Cook, W. P.	W. Roads.....	40	1	1	1	1	4	1	1	1	1	
6	Divine, J. M.	W. B. Divine.....	80	1	1	1	1	4	1	1	1	1	
7	Gardner, D. E.....	D. E. Gardner.....	14	1	1	1	2	4	1	1	1	1	
8	Gilkey, E.	T. Simpson.....	162	1	1	1	2	2	1	1	1	1	
9	Hanshaw, W. H.	W. H. Hanshaw.....	20	1	1	1	2	2	1	1	1	1	
10	Hines, E.	H. E. Bailey.....	50	1	1	1	1	1	1	1	1	1	
11	Jones, Isaac.....	Webster & Boyer.....	222	1	1	1	1	4	1	1	1	1	
12	Joyce, A. H.	Campbell & Waters.....	52	1	1	1	2	2	1	1	1	1	
13	Miller, W. L.	S. W. Knecht.....	105	1	1	1	1	1	1	1	1	1	
14	Lasley, M.	Lasley & Olanch.....	120	1	1	1	1	1	1	1	1	1	
15	Prosser, John J.	John J. Prosser.....	12	1	1	1	20	1	1	1	1	1	
16	Short, Josiah.....	Josiah Short.....	206	1	1	1	3	1	1	1	1	1	
17	Spear, M. M.	M. M. Spear.....	55	1	1	1	1	1	1	1	1	1	
18	Still, W. H.	W. H. Still.....	50	1	1	1	1	1	1	1	1	1	
19	Strambo, D. D.	D. D. Strambo.....	20	1	1	1	1	7	1	1	1	1	
20	Travis, Joseph.....	Jos. Travis.....	105	1	1	1	1	1	1	1	1	1	
21	Waiser, G. H.	Thomas, Andrews, Boyer	175	1	1	1	1	1	1	1	1	1	
22	Waltman, J. H.	P. E. Waltman.....	60	1	1	1	1	1	1	1	1	1	
23	Wear Coal Co., No. 3.....	Wear Coal Co.....	236	1	1	1	44	1	1	1	1	10	
24	Williams, W. H.	W. H. Williams.....	35	1	1	1	1	1	1	1	1	1	
Totals			2,177	2	9	5	8	1	7	16	21	2	1

STATISTICS OF

BATES

Office number.....	Name of company or mine owner.	Operator.	No. of days worked....	Kind of opening		Depth of shaft.....	Thickness of coal... Feet.....	Kind of power.			How ventilated.		
				Strip-pit.....	Drift.....			Steam.....	Hand Horse.....	Electricity..	Natural.....	Furnace.....	Fan-diam..
1	Ackerman, Jas	Jas. Ackerman.....	40	1	1	2	6	1					
2	Bellier, N.....	N. Bellier.....	200	1	1	4	10	1				12	
3	Bruce-Reese Coal Co.....	Bruce-Reese Coal Co.....	210	1	1	4	6	1					
4	Cooper, Benj.....	Benj. Cooper.....	20	1	1	4	6	1		1			
5	Denier Bros.....	Denier Bros.....	212	1	1	4	6	1					
6	Gee Coal Co.....	Gee Coal Company.....	130	1	1	4	6	1			1		
7	Griggs, J. C.....	J. C. Griggs.....	155	1	1	4	6	1					
8	Guttridge, G. H.....	J. W. Martin.....	16	1	1	24	3	6	1				
9	Hines Bros.....	Hines Bros.....	172	1	1	4	6	1					
10	Hough & Stringer.....	Hough & Stringer.....	90	1	1	3	6	1					
11	Ingram & Co.....	Ingram & Co.....	93	1	1	3	6	1					
12	Langcake & Hesse.....	Langcake & Hess.....	165	1	1	4	6	1			1		
13	Lowder, W. H.....	W. H. Lowder.....	200	1	1	4	6	1					
14	Martin, F. M.....	F. M. Martin.....	160	1	1	3	10	1					
15	Mullier Willis.....	G. B. Pettitt.....	24	1	1	22	8	1				1	
16	Olympia Coal Co.....	J. M. Tatley.....	105	1	1	3	2	1					
17	Pearson, Robt.....	Robt. Pearson.....	215	1	1	4	3	1				1	
18	Pearson, Peter.....	Peter Pearson.....	160	1	1	5	6	1					
19	Rankin, J. C.....	J. C. Rankin.....	189	1	1	2	10	1				1	
20	Reed, Jerry.....	Jerry Reed.....	40	1	1	2	6	1					
21	Rich Hill C. & M. Co.....	R. H. C. & M. Co., mine 15	195	1	1	105	4	1				15	
22	" ".....	" ".....	120	1	1	4	1						
23	" ".....	" ".....	41	1	1	105	3	10	1			12	
24	" ".....	" ".....	185	1	1	83	3	10	1			12	
25	Scrivner & Co.....	Scrivner & Co.....	208	1	1	3	1	1				1	
26	Shaw & Thurman.....	Morrell & Fortney.....	60	1	1	2	6	1					
27	Shaw, C. A.....	C. A. Shaw.....	40	1	1	3	6	1					
28	Stover & McMullier.....	Stover & McMullier.....	130	1	1	3	10	1				1	
29	Turtelotte, A.....	A. Turtelotte.....	122	1	1	4	1	1				1	
30	Walnut Coal Co.....	T. J. & J. L. Farrell.....	90	1	1	3	6	1					
31	Walnut Creek Coal Co.....	W. H. Mace & Co.....	27	1	1	30	3	1				1	
32	Western Coal & Mining Co..	Pryor & Bendure.....	84	1	1	3	10	1					
33	" ".....	Henry Washburn.....	180	1	1	2	10	1				1	
	Totals.....		4,078	6	12	2	13	4	15	1	10	6	4

COAL MINES—Continued.

COUNTY.

Long-wall.....	Pillar and room.....	Amount and cost of powder.		Mules worked.	Employees.			Price paid for mining.		Tons of coal mined....	Price paid per ton at mines.....	Amt received for total output year ending June 30, 1890.....	Office number.....	
					Miners	Others	Total.							
		No. of kegs	Cost.....		Summer... Winter....	Winter.... Summer...	Winter.... Summer...	Winter.... Summer...	Winter.... Summer...					
1	20	240 00		4	4	2	2	4	6	\$ 50	1,000	\$1 00	\$1,000	1
1	650	910 00	6 6	25	25	6	6	31	31	52	2,819	1 25	2,524	2
1	1	1 90		2	2	2	2	2	2	75	13,500	81	10,935	3
1	142	284 00		12	12	3	3	15	15	50	60	1 50	90	4
1	300	600 00	8 6	26	26	8	6	34	26	50	6,496	92	5,976	5
1	16	32 00		2	2	4	4	6	6	50	10,000	97½	9,975	6
1				3	3	1	1	4	4		2,386	1 14	2,720	7
1	48	96 00		5	5	10	10	15	15	40	77	1 60	123	8
1	20	35 00		4	4	1	1	5	5	50	6,284	1 11	6,963	9
1						20	20				680	1 00	680	10
1	110	220 00		9	9	3	3	12	12	50	4,545	1 10	5,000	11
1	528	1,056 00	2 1	12	12	3	3	15	13	47	5,222	1 25	6,527	12
1	20	40 00		2	2	4	4	6	6		10,044	84½	8,739	13
1	3	5 25		2	2			2	2	50	2,420	1 17	2,831	14
1	20	35 00		2	2	6	6	2	2	50	85	1 50	128	15
1	786	1,572 00	2 2	30	18	3	2	33	20	47	1,000	1 00	1,000	16
1	21	37 80		3	3	1	1	4	4	52	85	1 50	128	15
1	145	253 75	1 1	8	5	1	1	9	6	45	1,315	1 40	1,841	18
1	5	9 50		2	2			2	2		2,800	1 10	3,100	19
1	8,984	17,968 00	40 40	206	224	91	94	297	318	50	160	1 00	160	20
1				10	10			10	10	55	200,959	88½	181,108	21
1	246	492 00		12	12	9	9	21	21	50	4,217	95	3,959	22
1	6,025	12,050 00	12 12	138	110	42	42	180	152	50	6,806	96	5,954	23
1	105	173 25	1 1	6	4	1	1	7	5	45	132,042	93	116,166	24
1	8	16 00		4	4			4	4		3,120	1 00	3,120	25
1	7	14 00		3	3			3	3		400	1 25	500	26
1				3	3			3	3		480	1 25	600	27
1				2	2	1	1	3	3	50	1,104	97	1,071	28
1				4	4			4	4	50	1,082	1 25	1,352	29
1	2	3 50	1 1	7	5	2	2	9	7	50	500	1 10	550	30
1	8	14 00		4	4			4	4		3,024	1 00	3,024	31
1	108	189 00	1 1	6	6			6	6	45	600	95	570	32
119	18,404	36,300 95	74 72	545	496	207	193	752	689		3,600	1 00	3,600	33
											441,983	90½	403,033	

STATISTICS OF

COOPER

Office number.....	Name of company or mine owner.	Operator.	No. of days worked...	Kind of opening			Depth of shaft,.....	Thickness of coal,.....	Inches.....	Kind of power.	How ventilated.
				Strip-pit.....	Drift.....	Slope.....					
				Shaft.....						Steam.....	Electricity.....
										Hand.....	Natural.....
										Horse.....	Partial.....
											None.....
1	Hazell Springs Coal Mine..	Chas. W. Hazell.....	105	1			1	6		1	1

DADE

1	Allen, Wm.....	Leonard & Allen.....	80	1			2	4		1	1
2	Finney, Mine.....	Finney & Simmons.....	110	1			2	4		1	1
3	Gardner, Wm.....	F. H. Gardner.....	90	1			2	4		1	1
4	Johnston, Jas.....	John Stephenson.....	60	1			2	4		1	1
5	McCluey, Robt.....	Robt. McCluey.....	157	1			2	4		1	1
6	Rector, Mine.....	Frank Farmer.....	90	1			2	4		1	1
7	Seaton, J. R.....	G. W. Hendricks.....	234	1			2	4		1	1
8	Waterberry, W. S.....	Gardner & Warwick.....	121	1		38	2	6		1	1
	Totals		942	1	4	3				1	7

GRUNDY

1	Grundy County Coal Co....	Grundy Co. Coal Co.....	210	1			174	1	6	1			10
2	Medicine Valley Coal Co...	M. V. Coal Co.....	60	1			210	1	6	1			1
	Totals.....		270	2					2			1	1

COAL MINES—Continued.

COUNTY.

Office number.....	Amt't received for total output year ending June 30, 1899.....	Price paid per ton at mines.....	Tons of coal mined....	Price paid for mining.		Employees.			Mules worked.	Amount and cost of powder.	Pillar and room.....
				Summer...	Winter....	Miners	Others	Total.			
1	\$490	\$1 50	320	.....	\$1 25	2	.....	2	.....	.....	1

COUNTY.

1.....	.....	.....	.....	3.....	.....	3.....	.....	\$ 87½	.....	343	\$1 25	\$429	1
1.....	.....	.....	.....	5.....	3.....	5.....	3.....	1 00	\$1 00	900	1 50	1,350	2
1.....	.....	.....	.....	2.....	.....	3.....	.....	1 00	.....	360	1 25	450	3
1.....	.....	.....	.....	3.....	.....	3.....	.....	1 00	.....	200	1 25	250	4
1.....	.....	.....	.....	7.....	7.....	8.....	8.....	1 00	1 00	1,100	1 50	1,650	5
1.....	.....	.....	.....	3.....	.....	3.....	.....	1 00	.....	480	1 50	720	6
1.....	.....	.....	.....	12.....	.....	12.....	.....	87½	87½	702	1 25	878	7
1.....	.....	.....	.....	5.....	.....	5.....	.....	1 00	1 00	845	1 40	1,183	8
8.....	.....	.....	.....	30	14	2	1	32	15	4,930	1 40	6,910	.....

COUNTY.

1.....	.....	.....	7	5	167	141	23	23	190	164	\$1 00	\$1 00	39,133	\$1 69	\$67,543	1
1.....	.....	.....	.....	.....	5.....	.....	2.....	.....	7.....	.....	1 25	.....	500	2 00	1,000	2
2.....	.....	.....	7	5	172	141	25	23	197	164	.....	.....	39,633	1 73	68,543	.....

STATISTICS OF

HENRY

Office number.....	Name of company or mine owner.	Operator.	No. of days worked....	Kind of opening		Depth of shaft.....	Thickness of coal, feet.....	Kind of power.	How ventilated.				
				Slope.....	Strip-plt.....				Steam.....	Electricity.....	Natural.....	Fan-diam.....	
													Drift.....
1	Blair, J. J.	Cooper Creek Coal Co. ...	120	1	...	16	3	4	1	...	1	...	
2	Bowen, R. & Son.....	R. Bowen & Son.....	182	1	...	18	6	1	1	...	1	...	
3	Burgess, L. L.	L. L. Burgess.....	44	...	1	...	3	1	...	...	1	...
4	Chappell, J. R.	C. W. Field.....	192	...	1	...	3	6	...	...	...	...
5	Co-operative Coal Co.	Co-operative Coal Co.	160	1	...	76	3	6	1	...	8	...	
6	Daley, R. B.	Ed. Allison.....	120	1	...	25	1	2	1	...	1	...	
7	Clark, David.....	David Clark.....	60	...	1	...	2	5	...	...	...	...
8	Dickey Clay Mfg. Co., W. S.	W. S. Dickey Clay Mfg. Co	274	1	...	25	10	1	...	...	1	...
9	England, Wm.	Wm. England.....	90	1	...	25	8	1	1	...	1	...	
10	Geahart, Theo.	Theo. Geahart.....	182	...	1	...	4	...	...	...	...	...
11	Hughes, W. E.	W. E. Hughes.....	194	1	...	22	4	6	1	...	1	...	
12	Hunt, W. R.	W. R. Hunt.....	30	...	1	...	1	8	...	...	...	...
13	Hurst, Mrs. J. W.	Mrs. J. W. Hurst.....	244	1	...	60	3	...	1	...	1	...	
14	Hurst, John.....	John Hurst.....	112	1	...	21	3	6	1	...	1	...	
15	Jenkins, W. H.	W. H. Jenkins.....	51	1	...	21	...	...	1	1	...	...
16	Jones, J. B.	J. B. Jones.....	26	...	1	...	3	6	...	...	...	...
17	Jordan Coal Co.	Jordan Coal Co.	265	1	...	55	8	1	...	...	1	...
18	Langley, W. H.	W. H. Langley.....	100	...	1	...	...	...	...	...	...	...
19	Long, Geo. W.	Geo. W. Long.....	60	...	1	...	1	4	...	...	...	...
20	Meranda, W. T.	W. T. Meranda.....	143	1	...	2	6	1	...	...	1	...
21	Miller, W. J.	L. W. Beaman.....	120	1	...	35	5	...	1	1	...	...
22	Pharis Coal Co.	T. A. Pharis.....	150	1	...	60	3	...	1	...	1	...	
23	Rayburn, D. O.	D. C. Rayburn.....	30	...	1	...	1	10	...	...	...	...
24	Rees, Wm., Jr.	Wm. Rees, Jr.	150	1	...	...	...	...	1	...	1	...
25	Rees, Wm., Sr.	W. D. Rees.....	250	1	...	38	3	9	1	...	1	...	
26	Smith Coal Co.	J. W. Smith.....	84	1	...	36	3	9	1	...	1	...	
27	Stockton, Mrs. S. B.	Mrs. S. B. Stockton.....	75	1	...	23	2	2	1	...	1	10	
28	Thompson & Co., Jno.	Jno. Thompson & Co.	257	1	...	58	3	4	1	...	...	...
29	Tyree, Jos.	Jos. Tyree.....	10	...	1	...	1	...	...	...	...	...
30	Watkins, J. P.	J. P. Watkins.....	200	1	...	31	2	...	1	1	...	...
31	Young, L. P.	L. P. Young.....	27	...	1	...	2	6	...	...	...	...
Totals.....			3,996	15	5	11	...	4	15	1	3	15	2

HOWARD

1	Fayette Coal Co.	Richard S. Jackson.	54	...	1	...	1	6	...	1	...	1	...
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JACKSON

1	Brush Creek Coal & M. Co.	Brush Cr. Coal & M. Co.	253	1	...	300	1	1	1	10
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JOHNSON

1	Barrowman Mine.....	John Barrowman	60	1	2	4	1	1		
2	Black Diamond.....	S. E. Hanna.....	70	1	40	3	6	1	1		
3	Bullock, P. H.....	Wooley & Co.....	80	.....	1	.....	2	3	1	.....	.....	1
4	Hedgecock, Isaac.....	Isaac Hedgecock.....	60	.....	1	.....	2	3	.....	.....	.....	.....
5	Highly, John.....	Jas. Fletcher.....	150	.....	1	.....	1	10	.....	1	.....	1
6	Melley, M. B.....	M. B. Melly.....	80	1	.....	1	6	.....	.....	1	.....	1
7	Northrup Mine.....	Moses McDaniel.....	85	1	.....	2	3	.....	.....	1	.....	1
8	Northrup, Mary.....	Geo. Northrup.....	242	1	.....	2	2	.....	.....	1	.....	1
9	Parks, Wilson.....	Jas. Fletcher.....	140	.....	1	.....	2	4	.....	1	.....	1
Totals.....			967	1	5	2	1	2	6	7	1

AL MINES—Continued.

COUNTY.

	Amount and cost of powder.		Mules worked.	Employees.			Price paid for mining.		Tons of coal mined....	Price paid per ton at mines.....	Amt received for total output year ending June 30, 1899.....	Office number.....
				Miners	Others	Total.						
	No. of kegs	Cost.....	Summer Winter....	Summer Winter....	Summer Winter....	Summer Winter....	Summer Winter....	Summer Winter....				
1	132	\$297 00	25	15	5	3	30	18	5,751	\$1 40	\$8,051	1
1			25	25	3	3	32	32	7,227	1 25	9,034	2
1					4	4	4	4	176	1 50	264	3
1					5	3	20	13	1,290	1 50	1,800	4
1					2	3	3	2	4,008	1 28	5,130	5
1									500	1 50	750	6
1									180	2 00	360	7
1	380	760 00	1	18	6	6	24	24	7,860	1 35	10,611	8
1	10	16 00		3	1	1	4	3	400	1 20	480	9
1	30	48 00		3	3	3	3	3	2,400	1 12½	2,700	10
1				3	2	1	4	3	854	1 50	1,281	11
1				3	2	1	3	3	80	1 25	100	12
1	230	460 00		3	1	1	3	3	3,345	1 35	4,515	13
1	43	86 00		4	3	1	5	4	672	1 45	975	14
1				3			3	3	240	1 25	300	15
1									80	2 00	160	16
1	808	1,736 00	2	45	40	8	53	48	15,214	1 50	22,821	17
1					3	3	3	3	500	1 75	1,032	18
1					3	3	3	3	298	1 50	447	19
1	75	150 00		5	3	1	6	4	810	1 50	1,215	20
1	24	48 00		5	3	2	7	5	900	1 50	1,440	21
1	40	80 00		7	9	2	9	11	2,400	1 45	3,480	22
1				7	3	1	8	5	130	1 50	180	23
1	41	82 00		7	3	1	9	5	2,100	1 45	3,120	24
1	75	150 00		8	6	1	9	5	2,500	1 40	3,600	25
1	84	168 00		8	6	1	10	7	2,000	1 40	2,800	26
1	12	21 00		3	3	1	4	4	400	1 50	600	27
1	510	1,020 00		40	30	2	43	32	16,800	1 35	23,280	28
1							3	3	40	2 00	80	29
1	40	80 00		14	7	1	16	8	2,000	1 75	3,500	30
1							3	3	108	1 50	162	31
18	2,594	5,202 00	7	248	191	47	325	238	81,373	1 45	114,358	

COUNTY.

				4		4	\$1 25		456	\$1 85	\$842	1
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COUNTY.

			3	3	100	65	18	14	118	79	\$1 00	\$ 87½	25,125	\$2 10	\$32,763	1
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COUNTY.

1				3			3		\$ 75		320	\$1 00	\$320	1
1	12	\$24 00		4		1	5		75		500	1 50	750	2
1				5		1	6		75		800	1 50	1,200	3
1				3			3		75		240	1 50	360	4
1	9	18 25		1	1		1	1	75	\$ 75	300	1 50	450	5
1				3	3		3	3	1 25	1 12½	400	1 75	700	6
1				6			8		75		1,030	1 00	1,020	7
1				2	1	1	3	2	87½	75	650	1 12½	731	8
1				2	2		2	2	75	75	480	1 50	720	9
7	21	42 25		20	7	5	34	8			4,710	1 32	6,231	....

AL MINES—Continued.

UNTY.

Amount and cost of powder.		Mules worked.	Employees.				Price paid for mining.		Tons of coal mined.	Price paid per ton at mines.	Amt received for total output year ending June 30, 1899.	Office number.
No. of kegs	Cost.		Miners	Others	Total.	Winter.	Summer.					
			3	1	4	\$1 12½		200	\$2 00	\$400	1	
			4	1	5	1 12½		1,485	1 62½	2,413	2	
			9	2	9	1 06½	89¾	4,000	1 75	7,000	3	
			35	2	37	1 00	87½	7,120	1 60	11,392	4	
			9	5	9	94	87½	2,898	1 75	5,070	5	
		8 3	140	25	160	1 00	87½	33,600	1 62½	54,600	6	
			50	8	58	1 00	75	10,402	1 37½	14,251	7	
			4	1	5	1 00		500	1 50	750	8	
			20	2	22	1 00	94	5,600	1 37½	8,600	9	
1		3 2	60	30	90	1 12½	94	14,000	1 40	18,900	10	
			2	1	3	1 12½		172	1 62½	280	11	
		1 1	40	6	46	1 00	75	14,593	1 70		12	
						87½				36,541	13	
		1 1	27	7	30	9	75	6,902	1 70		14	
				2	1		75	160	2 00	320	15	
		1 1	11	2	13	10	81¼	5,682	1 34	7,615	16	
				1	3		1 12½	331	1 50	500	17	
			6	1	7	7	75	1,100	1 50	1,650	18	
			12	2	14		1 00	3,200	1 75	5,600	19	
			3	1	4		1 25	125	1 75	220	20	
			3	1	4	4	1 00	480	1 75	840	21	
			5	3	8	6	1 00	1,200	1 50	1,800	22	
			4	2	6	5	1 12½	700	1 75	1,250	23	
			6	2	8	8	1 12½	1 00	1 75	2,100	24	
						75	75				25	
		4 4	84	18	102	87½	81¼	52,178	1 25		26	
						50	45				27	
		10 9	90	48	142	60	50	58,687	1 24		28	
						87½	75				29	
		4 2	54	7	61	1 00	81¼	17,434	1 28	233,371	30	
						87½	75				31	
		6 6	80	14	98	1 00	81¼	38,842	1 22		32	
						87½	75				33	
		5 5	80	16	98	1 00	81¼	20,552	1 24		34	
			5	5	2	1 00	87½	800	1 50	1,200	35	
		1 1	45	3	48	18	1 12½	10,800	1 62½	17,550	36	
		4 2	120	10	130	12	1 00	21,600	1 45	31,320	37	
		4 2	45	2	50	22	1 00	9,000	1 48	13,320	38	
		1 1	6	1	7	4	1 15	1,155	1 50	1,733	39	
			2	1	2	1	1 12½	400	1 75	705	40	
		1 1	45	2	47	21	1 12½	8,628	1 35	11,649	41	
				1	6		1 00	900	2 00	1,800	42	
					7		1 25	160	1 75	280	43	
		1 1			2		1 00	90	1 50	1,643	44	
					2		1 00	120	2 00	240	45	
		1 2	50	4	54	17	87½	12,636	1 42	18,034	46	
			5	1	6	3	1 00	3,432	1 50	5,198	47	
							1 12½	60	1 75	105	48	
				2	1	9	1 00	1,186	1 25	1,483	49	
			3		3	2	1 00	740	1 20	888	50	
			9	1	10	8	1 20	3,000	1 50	4,500	51	
1			18	5	23	23	60	5,795	1 30	7,533	52	
		2 1	60	3	63	6	1 00	6,500	1 30	8,450	53	
			4		4	2	1 00	720	1 50	1,080	54	
0	2	62 44	1284	588	211	164	1495	392,068	1 38	544,179		

COAL MINES—Continued.

COUNTY.

Office number.....	Total amt. received for the year's output of coal.....	Price received at mine per ton.....	Total tons of coal mined.....	Price paid for mining.		Employees.				Pillar and room.....	Long-wall.....				
						Miners.	Others.	Total.	Summer.....						
												Winter.....	Summer.....	Winter.....	Summer.....
										No. kegs..	Cost.....	Summer.....	Winter.....		
1	\$5,365	\$1 85	2,900	\$ 75	\$ 90	8	19	3	15	5	4	3	1	1	6
2	1,815	1 50	1,210	1 00	1 00	3	7	1	6	2	1	1	1	1	1
3	2,934	1 75	1,677	1 00	1 00	4	14	1	11	175	215	12	4	9	263
4	89,741	1 45	61,890	1 00	1 00	9	226	184	12	4	2	2	2	11	191
5	4,207	1 75	2,404	1 00	1 00	5	14	11	12	2	2	2	2	11	21
6	3,250	1 62½	2,000	85	1 00	4	11	4	9	2	2	2	2	11	17
.....	107,312	1 48	72,081	208	284	208	263	191	21	17	284	208	6

COUNTY.

1	1	6	3	2	1	8	4	\$1 25	\$1 12½	800	\$2 00	\$1,600	1
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COUNTY.

1	1	2,343	\$4,686 00	17	14	160	140	70	60	230	200	\$ 50	\$ 50	96,329	\$ 97	\$94,092	1
1	1	36	72 00	2	2	1	1	3	3	75	75	1,600	1 25	2,000	2
1	1	4,945	9,890 00	16	16	275	275	90	90	365	365	50	50	180,664	1 00	.....	3
1	1	2,379	4,758 00	26	22	160	150	65	50	225	200	50	50	87,152	1 00	.....	4
1	1	382	764 00	3	3	20	20	10	10	30	30	50	50	15,745	1 00	435,145	5
1	1	4,238	8,476 00	14	14	161	161	45	45	206	206	50	50	119,319	1 00	.....	6
1	1	887	1,764 00	6	6	105	100	40	40	145	140	50	50	32,265	1 00	.....	7
1	1	300	600 00	3	2	100	80	7	7	107	87	60	60	32,252	1 00	32,252	8
1	1	2,047	4,094 00	21	24	101	107	40	41	141	148	50	50	64,079	89	57,010	9
1	1	8	16 00	.....	.....	2	.....	.....	2	.....	.....	.....	.....	370	1 12½	416	10
1	1	.....	.....	.....	.....	3	2	1	1	4	3	87½	87½	800	2 00	1,600	11
1	1	24	48 00	.....	.....	4	2	1	1	5	3	75	75	2,000	1 25	2,500	12
1	1	.....	.....	.....	.....	2	.....	1	.....	3	.....	1 00	.....	150	1 50	225	13
1	1	3,180	6,337 00	13	12	175	150	25	20	200	170	50	50	106,568	92	97,892	14
1	13	20,769	42,005 00	119	113	1270	1189	393	366	1666	1555	.....	.....	739,293	97	723,132	.....

COUNTY.

1	1	.....	.....	.....	2	1	.....	.....	2	1	\$ 75	\$ 75	500	\$1 25	\$825	1
1	1	3	\$7 50	.....	2	1	.....	.....	2	1	1 00	85	300	1 50	450	2
1	1	.....	.....	.....	2	.....	.....	.....	2	.....	1 00	.....	160	1 50	240	3
2	1	3	7 50	.....	6	2	.....	.....	6	2	.....	.....	960	1 37	1,315	.....

COUNTY.

1	1	8	\$14 00	.....	6	3	.....	.....	6	3	\$ 75	\$ 75	2,430	\$1 50	\$3,645	1
1	1	.....	.....	.....	2	.....	1	.....	3	.....	75	.....	240	1 25	300	2
2	2	8	14 40	.....	8	3	1	.....	9	3	.....	.....	2,670	1 48	3,945	.....

STATISTICS OF

NODAWA

Office number.....	Name of company or mine owner.	Operator.	No. of days worked....	Kind of opening		Depth of shaft.....	Thickness of coal.. Feet.....	Kind of power.	How ventilated
				Strip-pit.....	Shaft.....				
				Drift.....	Slope.....		Inches.....	Electricity..	Staircase, Natural.....
								Hand.....	
								Horse.....	
								Steam.....	
1	Carpenter, Roe.....	J. O. Pearson.....	180	1	..	71	1	1	1
2	Davis, S.....	S. Davis.....	90	1	..	35	1	1	1
3	Gordon, Geo. W.....	Jacob Bigley.....	100	1	..	35	1	1	1
	Totals.....		370	3	..			3	1

PETTIS

1	Stevens, B. F.....	A. Carson.....	200	1	70	2	10	1	1	...
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PUTNAM

1	Blackbird Block Coal Co..	Lane & Jordon.....	140	1	52	9	1	12	
2	Emporia C'l Co., Price & Bro	John J. Price & Bro.	170	1	110	2	9	1	1	
3	Guffey, Alexander.....	Guffey, Rex & Percy	120	...	1	...	...	3	6	...	1	...	...
4	Leek, John.....	John Leek.....	85	...	1	...	...	3	4	...	1	1	...
5	Mendota Coal & Mining Co	Mendota Coal & Min'g Co.	289	1	...	...	67	3	...	1	...	...	12
6	Nogle, John.....	Boyd & Patterson.....	240	1	...	...	40	3	...	1	...	1	...
7	Rogers Bros.....	John and Wm. Rogers.....	216	...	1	...	...	3	6	...	1	...	1
8	Star Coal Co.....	Star Coal Co.....	230	...	1	...	...	2	8	...	1	...	1
Totals.....			1,480	4	1	3	3	3	1	...	3	2

RALLS

1	Adkinson, John	John Adkinson.....	30	1	1	2	1	1	
2	Fitzpatrick Bros.....	Fitzpatrick Bros.....	120	1	61	2	4	1	1
3	Ralls County Coal Co.....	Ralls County Coal Co..	271	1	45	2	2	1	1
	Totals.....	.....	421	2	1			2	1

MINES—Continued.

TY.

Office number.....	Amt. received for total output year ending June 30, 1899.....	Price paid per ton at mines.....	Tons of coal mined...	Price paid for mining.		Employees.			Mules worked.	Amount and cost of powder.	
				Summer...	Winter....	Total.	Others	Miners			
1	\$2,700	\$2 25	1,200	\$1 00	6	Summer...	Winter....	Summer...	Summer...	Cost.....	No. of kegs
2	2,025	2 50	810	1 25	9	Summer...	Winter....	Summer...	Winter....	.....	.....
3	850	2 21	340	2 00	3	Summer...	Winter....	Summer...	Winter....	.....	.....
	5,575	2 35	2,350		6	Summer...	Winter....	Summer...	Winter....

NTY.

				8	5	2	2	10	7	\$ 75	\$ 75	3,200	\$1 75	\$5,600	1
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NTY.

				1	20	6	3	26	15	\$ 70	\$ 70	1,843	\$1 15	\$2,170	1
				1	45	25	4	27	27	70	60	9,484	1 06½	10,109	2
				3	3	3	3	70	60	720	1 00	720	3
				6	...	2	...	8	...	80	...	1,010	1 00	1,010	4
				13	250	50	44	300	284	80	70	103,081	1 08	111,709	5
				6	2	1	1	7	3	68	60	1,500	1 25	1,875	6
				1	16	8	4	20	10	75	62½	4,800	1 00	4,800	7
				1	12	8	3	15	11	68	60	4,235	98	4,114	8
				19	358	298	70	55	428	70	60	120,073	1 07	136,507	

NTY.

				2	...	...	...	2	...	\$ 87½	...	85	\$1 25	\$112	1
				20	17	3	2	23	19	86	80	4,320	1 15	5,141	2
				27	31	7	7	34	38	75	75	11,609	1 25	14,512	3
				49	48	10	9	59	57			16,014	1 23	19,765	

STATISTICS OF

RANDOLPH

Office number.....	Name of company or mine owner.	Operator.	No. of days worked ..	Kind of opening			Depth of shaft.....	Thickness of coal.....	Kind of power.			How ventilated.	
				Shaft.....	Drift.....	Scrip-pit.....			Steam.....	Hand.....	Electricity.....	Natural.....	Fan-diam.....
1	Bradley, D. F.....	D. F. Bradley.....	130	1	..	..	60	4	..	1	..	1	1
2	Brown & Welsby.....	Brown & Welsby.....	200	1	..	..	85	3	4	1	..	1	1
3	Cooper & Stackhouse.....	A. B. Cooper & Co.....	205	1	..	..	125	4	1	1	..	1	1
4	Dean, H. M.....	H. M. Dean.....	140	..	1	..	..	..	..	1	1	1	1
5	Elliott Coal Co., No. 3.....	Elliott Coal Co.....	257	1	..	..	145	4	4	1	..	1	12
6	Elliott Coal Co., Nos. 4 and 5.....	Elliott C. Co., Santiago.....	30	..	1	..	..	4	1	1	1	1	1
7	Enterprise Coal Co.....	John Cronan.....	203	..	1	..	4	..	1	1	1	1	1
8	Higbee Coal and Mining Co.....	Higbee Coal & Mining Co.....	190	1	..	..	175	3	8	1	1	1	10
9	Hudson, D. M.....	D. M. Hudson.....	70	..	1	..	4	6	1	1	1	1	1
10	Hunt Coal Co.....	Hunt Bros.....	130	..	1	..	4	4	1	1	1	1	1
11	Huntsville Coal Co.....	Huntsville Coal Co.....	137	1	..	..	100	4	1	1	1	1	12
12	Interstate Mining Co.....	Interstate Mining Co.....	229	1	..	..	110	3	8	1	1	1	12
13	Jones & Davis.....	Jones & Davis.....	140	1	..	..	4	2	1	1	1	1	1
14	".....	".....	126	1	..	..	96	4	1	1	1	1	10
15	".....	".....	240	1	..	..	96	4	1	1	1	1	10
16	Lewis, J. J.....	J. J. Lewis.....	96	..	1	..	4	..	1	1	1	1	1
17	Mitchell, W. E.....	W. E. Mitchell.....	250	..	1	..	4	..	1	1	1	1	1
18	Morris, John.....	J. L. Morris.....	180	..	1	..	3	8	1	1	1	1	1
19	Robinson, J. L.....	J. L. Robinson.....	245	..	1	..	4	..	1	1	1	1	1
20	Ward, Harry.....	Harry Ward.....	150	1	..	..	88	3	10	1	1	1	1
Totals.....			3,348	10	4	6	..	..	8	10	2	3	11

RAY

1	Blair, Andrew.....	Blair, Andrew.....	130	1	..	..	30	2	..	1	1	1	1
2	Bryan, J. B.....	Bucklinger & Kamerat.....	150	..	1	..	..	1	4	1	1	1	1
3	Chenault, A. R.....	A. R. Chenault.....	109	1	..	..	90	1	6	1	1	1	1
4	Climax Mine, W. H. Blunt.....	W. H. Blunt.....	60	1	..	..	160	1	7	1	1	1	1
5	Crispen, Chas.....	Chas. Crispen.....	175	1	..	..	80	2	1	1	1	1	1
6	Duncan, Henry.....	Wm. Sickles.....	90	..	1	..	..	..	..	1	1	1	1
7	Hayson, Robt.....	Robt. Hayson.....	185	1	..	..	80	2	..	1	1	1	1
8	Hubbell & Fisher.....	Hubbell Coal Co.....	72	1	..	..	110	2	4	1	1	1	1
9	Huston, F.....	F. Huston.....	90	..	1	..	1	6	1	1	1	1	1
10	Kallenberger, Jno. J.....	Jno. J. Kallenberger.....	90	..	1	..	1	8	1	1	1	1	1
11	Kansas & T. C. Co., No. 30.....	Kansas & Texas C. Co.....	92	1	..	..	70	1	10	1	1	1	12
12	King, R. A.....	Jas. Dorne.....	60	..	1	..	..	1	8	1	1	1	1
13	Loeven, Jos.....	Jas. Loeven.....	189	..	1	..	..	1	8	1	1	1	1
14	Marshall Heirs.....	Jas. M. Edgar.....	141	..	1	..	..	1	6	1	1	1	1
15	Mercantile Coal Co.....	Mercantile Coal Co.....	264	1	..	..	90	2	1	1	1	1	1
16	Mosby Bros., Mine No. 10.....	Mosby Bros.....	85	..	1	..	1	6	1	1	1	1	1
17	Pence & Calnen.....	Pence & Calnen.....	200	1	..	..	85	2	1	1	1	1	1
18	Pence Bros.....	Pence Bros.....	90	1	..	..	40	2	1	1	1	1	1
19	Pickering Coal Co.....	Pickering Coal Co.....	211	1	..	..	107	2	1	1	1	1	1
20	Rankin Coal Co.....	Rankin Coal Co.....	140	..	1	..	..	..	1	1	1	1	1
21	Ray Co. Br., T. & Coal Co.....	W. J. Lynch.....	80	..	1	..	1	6	1	1	1	1	1
22	Richmond & Camden C. Co.....	R. & C. Coal Co., 7 mines.....	195	7	..	..	50	2	6	1	1	1	10
23	Sevier, Chas.....	Ottman & Swopes.....	72	..	1	..	120	2	6	1	1	1	12
24	Starr, Alex.....	P. F. Smith.....	105	..	1	..	1	6	1	1	1	1	1
25	The Major Grimes C. Mine.....	Hugh Blair.....	105	1	..	..	190	2	1	1	1	1	1
26	The Williams Coal Co.....	R. J. Williams.....	160	1	..	..	107	1	8	1	1	1	1
Totals.....			3,340	20	1	11	..	..	11	12	9	12	17

COAL MINES—Continued.

COUNTY.

Pillar and room. Long-wall.....	Amount and cost of powder.		Miles worked.	Summer Winter.....	Employees.				Price paid for mining.		Tons of coal mined.....	Price paid per ton at mines.....	Amt received for total output year ending June 30, 1899.....	Office number.....			
	No. of kegs	Cost.....			Miners	Others	Total.	Summer Winter.....	Summer Winter.....								
1	1				3	2	2	2	5	4	\$ 75	\$ 75	800	\$1 00	800	1	
1	1				3	2	2	2	4	4	75	75	1,200	1 25	1,500	2	
1	1	400	\$800 00	3	35	20	3	3	38	23	50	50	13,300	1 05	14,000	3	
1	1	15	30 00		2	1			2	1	70	70	400	1 00	400	4	
1	1			8	80	80	27	27	107	107	75	75	59,890	1 06	64,600	5	
1	1	150	300 00	3	33		18	51			50		2,117	1 06		6	
1	1	90	180 00	1	9	5	3	12	8		70	70	7,820	1 00	7,820	7	
1	1	50	100 00	4	92	72	20	112	91		75	75	38,305	1 10	42,136	8	
1	1	7	14 00		2			2			75		275	1 12½	309	9	
1	1	60	120 00	1	6	5	3	9	7		50	50	1,983	1 25	2,479	10	
1	1	900	1,800 00	12	100	60	45	139	99	72	50	50	23,000	1 00	17,250	11	
1	1	150	300 00	10	220	42	45	262	265		75	75	96,205	1 10	105,275	12	
1	1	1,213	2,426 00	6	5	100	89	5	105	94	50	50	30,329	75		13	
1	1	294	588 00	3	40	43	5	45	48		50	50	7,344	75	75,350	14	
1	1	1,759	3,518 00	5	4	80	77	6	7	86	84	50	50	62,794	75		15
1	1	50	87 50	1	6	3	3	3	9	6	70	70	1,090	1 25	1,365	16	
1	1	82	164 00	1	10	5	4	2	14	7	70	70	3,730	1 15	4,122	17	
1	1	10	20 00	1	4	2	1	1	5	3	70	70	678	1 00	678	18	
1	1	36	59 40	1	4	2	1		5	2	70	70	1,650	1 12½	1,857	19	
1	1	54	108 00		4	4	1	1	5	5	70	75	1,296	1 12½	1,311	20	
317	5,320	10,614	90 57	54	780	711	139	153	899	864			354,830	96	341,252		

COUNTY.

1				3				3		\$1 00		\$850	\$1 50		\$975	1
1				5	2			5	2	1 00	\$1 00	1,050	1 50		1,575	2
1				4		1		6		1 00		981	1 50		1,471	3
1				10	3	2	1	12	4	87½	87½	2,400	1 50		3,600	5
1				2				2		1 00		180	1 75		315	6
1				5	3		1	6	4	87½	87½	1,300	1 50		1,950	7
1				20		5		25		2,000	1 30	2,000	1 30		2,600	8
1				6				4		600	1 75	600	1 75		1,050	9
1				6				6		540	1 75	540	1 75		945	10
1				75	35	10	5	85	40	23,854	1 35	32,203	1 35		43,407	11
1				2				2		160	1 75	2,280	1 75		2,280	12
1				3				3		1,300	1 75	2,275	1 75		2,275	13
1				8				8		505	1 75	884	1 75		884	14
1				100	100	13	13	113	113	35,908	1 15	41,295	1 15		41,295	15
1				2				2		354	1 40	468	1 40		468	16
1				60	40	4	3	64	43	25,554	1 25	31,943	1 25		31,943	17
1				50		3		53		5,000	1 40	7,000	1 40		7,000	18
1				35	19	9	4	44	33	14,682	1 42	20,900	1 42		20,900	19
1				40	35	2	2	42	37	8,354	1 35	11,278	1 35		11,278	20
1				5				5		400	1 75	700	1 75		700	21
7				12	10	300	250	50	40	350	290	112,000	1 40		156,800	22
1				6			1	7		648	1 30	842	1 30		842	23
1				3	1			3	1	400	1 75	700	1 75		700	24
1						1		5		525	2 00	1,050	2 00		1,050	25
1				35	20	2	2	37	22	13,000	1 25	16,250	1 25		16,250	26
32				28	23	792	513	105	71	897	584	252,083	1 34½		340,065	

STATISTICS OF

ST. CLAIR

Office number.....	Name of company or mine owner.	Operator.	No. of days worked..	Kind of opening			Depth of shaft.....	Thickness of coal... Feet.....	Kind of power.			How ventilated.		
				Strip-pit.....	Drift.....	Slope.....			Steam.....	Hand.....	Electricity.....	Natural.....	Furnace.....	Fan-dam..
1	Allison, R. W.....	R. W. Allison.....	40	1				3	6		1	1		
2	Clapp, W.....	W. Clapp.....	20		1			3				1		
3	Egger, J. B.....	Wm. Howard.....	123		1			110				1		
4	Griggs, L. L.....	L. L. Griggs.....	50	1				110		1		1		
5	Knierim, John.....	Knierim Bros.....	69	1			20	2		1		1		
6	Lewellyn, Mrs. Sarah.....	J. M. Fitch.....	60		1			2			1	1		
7	McColey, W. F.....	W. F. McColey.....	25		1			3						
8	Mims, C.....	C. Mims.....	80	1				3		1		1		
9	Oliver, Alex.....	Oliver Bros.....	90		1			2						
10	Pharis, H. L.....	J. A. Matthews.....	51		1			3						
11	Pratt, Joel.....	Harvey T. Pratt.....	48		1			3						
12	Seymore, W. A.....	W. A. Seymore.....	160	1			60	2	6	1		1		
13	Short Mine.....	J. M. Short.....	30		1			2	8		1	1		
14	Wooden, H. M.....	H. M. Wooden.....	50	1			20	3			1	1		
Totals.....			896	3	2	3	6		2	7		9		

SALINE

1	Highly & Lambert.....	Highly & Lambert.....	102		1			1	8		1	1		
2	Stucker, Fred.....	Fred Stucker.....	105	1			35	1	8		1	1		
3	Terrel, Henry C.....	John Brady.....	30		1			1	6		1	1		
4	Whitaker, Mark.....	M. Whitaker.....	70		1			1	8		1	1		
Totals.....			307	1	2	1			2	2		4		

SCHUYLER

1	Bradburn & Mock.....	Bradburn & Mock.....	120	1			28	3	8		1		1	
2	Mock, A. J.....	A. J. Mock.....	90		1			3	8		1		1	
3	Golston, Ira.....	Ira Golston.....	60	1			60	4				1		
4	Zola Coal Co.....	Zola Coal Co.....	140	1			28	3	8		1		1	
Totals.....			270	3		1			3	1		2	2	

AL MINES—Continued.

UNTY.

Amount and cost of powder.		Mules worked.	Employees.					Price paid for mining.		Tons of coal mined.	Price paid per ton at mines.	Amt. received for total output year ending June 30, 1898.	Office number.
			Miners	Others	Total.								
No. of kegs	Cost.	Summer	Winter	Summer	Winter	Summer	Winter	Winter	Summer				
3	\$4 50	1	1	2	1	1	1	\$1 00	.....	120	\$1 50	\$180	1
15	26 75	1	1	2	3	2	5	1 00	.....	65	1 75	114	2
13	23 40	4	3	4	4	4	5	1 00	.....	993	1 75	1,638	3
		3	1	4	4	4		90	.....	300	2 00	600	4
		3	1	2	2	2		75	.....	250	1 30	325	5
		3	1	2	2	2		75	.....	160	1 25	200	6
		3	1	2	2	2		75	.....	100	1 15	115	7
		3	1	2	2	2		75	.....	240	1 50	360	8
		3	1	2	2	2		75	.....	800	1 50	1,200	9
		3	1	2	2	2		75	.....	162	1 50	240	10
		3	1	2	2	2		75	.....	160	1 25	200	11
		3	1	2	2	2		75	.....	460	1 50	690	12
		3	1	2	2	2		75	.....	200	1 40	280	13
		3	1	2	2	2		75	.....	200	1 25	250	14
31	54 65	23	1	14	14	37	15	.....	.....	4,210	1 51	6,392	

UNTY.

4	\$8 00	12	2	2	2	2	2	\$1 00	\$1 00	300	\$1 50	450	1
		4	2	2	2	4	2	1 00	1 00	700	2 00	1,400	2
		3	1	1	1	3	1	1 50	1 50	120	2 50	300	3
		2	2	2	2	2	2	1 25	1 25	200	2 25	450	4
4	8 00	11	7	11	7	11	7	.....	.....	1,320	1 97	2,600	

UNTY.

1		1	10	1	11	\$ 75	.....	1,955	\$1 12½	2,199	1
1		3	2	3	3	87½	.....	329	1 25	411	2
1		2	2	2	2	87½	.....	230	1 25	275	3
1		1	10	3	13	75	.....	2,800	1 12½	3,150	4
4		2	25	4	29	.....	.....	5,304	1 14	6,035	

STATISTICS OF

VERNON

Office number.....	Name of company or mine owner.	Operator.	No. of days worked..	Kind of opening			Depth of shaft.....	Thickness of coal... feet.....	Kind of power.	How ventilated.				
				Slope.....	Drift.....	Strip-pit.....				Hand.....	Electricity..	Natural.....	Furnace.....	Fan-diam....
1	Arthur Coal Co.....	Hudson & Williams.....	200	1	1	1	5	1	1	1	1	1	1	1
2	Auger, B. F.....	Frank Zaner.....	60	1	1	1	20	4	1	1	1	1	1	1
3	Baker, Frank.....	Frank Baker.....	31	1	1	1	1	1	1	1	1	1	1	1
4	Bedford Coal Co.....	D. Hughes.....	208	1	1	1	50	1	1	1	1	1	1	10
5	Bryan, Geo. F.....	Geo. F. Bryan.....	15	1	1	1	6	1	1	1	1	1	1	1
6	Central Coal & Coke Co....	Central Coal & Coke Co.	92	1	1	1	180	4	1	1	1	1	1	15
7	Collett Geo.....	Geo. Collett.....	55	1	1	1	2	1	1	1	1	1	1	1
8	Dunn Edwin.....	Edwin Dunn.....	75	1	1	1	2	1	1	1	1	1	1	1
9	Hill Mine.....	F. B. Auger.....	122	1	1	1	2	1	1	1	1	1	1	1
10	Jones, P. W.....	David Perkins.....	175	1	1	1	2	1	1	1	1	1	1	1
11	Lowe, J. A.....	J. A. Lowe.....	50	1	1	1	4	1	1	1	1	1	1	1
12	Mayberry F. M.....	F. M. Mayberry.....	163	1	1	1	4	1	1	1	1	1	1	1
13	Moss Bros.....	Moss Bros.....	130	1	1	1	4	1	1	1	1	1	1	1
14	Raddy, F. M.....	F. M. Raddy.....	10	1	1	1	3	1	1	1	1	1	1	1
15	Rich Hill Coal & Min'g Co.	R. H. C. & M. Co. M. No. 17	206	1	1	1	142	4	1	1	1	1	1	15
16	" " " " " "	" " " " " "	21	1	1	1	88	3	1	1	1	1	1	12
17	Roach, T. N.....	Roach, T. N.....	45	1	1	1	2	1	1	1	1	1	1	1
18	Smith, E. F.....	P. G. Smith.....	20	1	1	1	1	1	1	1	1	1	1	1
19	Still, J. W.....	J. W. Still.....	15	1	1	1	1	1	1	1	1	1	1	1
20	Vernon Coal Co.....	Vernon Coal Co.....	60	1	1	1	3	1	1	1	1	1	1	10
Totals.....			2,019	5	6	2	8	5	5	3	5	3	5	5

COAL MINES—Continued.

COUNTY.

Pillar and room..... Long-wall.....	Amount and cost of powder.		Mules worked.		Employees.						Price paid for mining.		Tons of coal mined....	Price paid per ton at mines.....	Amt received for total output year ending June 30, 1899.....	Office number.....
					Miners		Others		Total.							
	No. of kegs	Cost.....	Summer .. Winter.....	Summer .. Winter.....	Summer .. Winter.....	Summer .. Winter.....	Summer .. Winter.....	Summer .. Winter	Summer ... Winter	Summer ... Winter						
1	960	1,920 00	4	4	30	30	14	14	44	44	\$ 52	\$ 48	28,860	1 07	32,001	1
1	15	30 00			4		1		5		75		540	1 25	675	2
1	1,012	2,024 00	3	3	30	25	3	3	33	28	52	48	22,980	94	21,480	3
1	3	6 00					2		2				65	1 12½	74	4
1	2,220	4,440 00	8	6	40	40	20	20	60	60	47	42	38,511	1 10	42,362	5
1	6	11 40			3				3		1 00		276	1 75	483	6
1	6	11 10			2				2		1 00		280	1 75	423	7
1	12	24 00	1	1	3	1			3	1	75	62½	500	1 25	625	8
1	24	46 80			4	1			5	1	1 00	1 00	865	1 25	1,081	9
1					9		3		12		1 00		3,000	1 50	4,500	10
1	60	120 00	3	3	4	4	2	2	6	6			2,458	1 25	3,100	11
1	94	165 44	3	3	5	5	10	10	15	15			5,900	1 50	9,250	12
1								3		3			90	1 50	135	13
1	1,736	3,472 00	2	1	29	20	15	13	44	33	50	50	41,346	88	34,240	14
1	4,993	9,986 00	10	10	103	103	32	32	135	135	55	55	96,497	92	91,574	15
1	5	10 00					4		4		55	55	380	2 00	760	16
1							3		3				140	1 25	175	17
1	2,892	5,784 00	16	16	60	60	6	6	66	66	47	42	55,054	94	51,868	18
13	14,038	28,050 74	47	44	329	289	119	103	448	392			298,382	98	295,271	19

TABLE X—Showing rank of coal producing counties in order of production for each of past nine years.

No. counties	Counties.	1891.		1892.		1893.		1894.		1895.		1896.		1897.		1898.		1899.		Av. annual product, 10 years past.
		Rank	Prod'ct, tons.	Rank.	Prod'ct, tons.	Rank.	Prod'ct, tons.	Rank.	Prod'ct, tons.	Rank.	Prod'ct, tons.	Rank.	Prod'ct, tons.	Rank.	Prod'ct, tons.	Rank.	Prod'ct, tons.	Rank.		
1	Bates	1	726,283	2	658,924	2	627,514	4	291,271	3	252,231	2	375,300	2	410,304	3	343,878	2	441,983	490,145
2	Macon	2	454,029	1	685,335	1	788,563	1	511,566	1	539,120	1	519,649	1	490,601	1	720,969	1	739,293	590,705
3	Lafayette	3	352,603	3	347,600	3	371,928	2	296,931	2	256,761	3	307,286	3	284,448	2	347,857	3	392,608	498,685
4	Ray	4	282,247	5	272,948	4	319,405	6	196,852	6	150,998	6	149,083	6	157,652	6	215,349	6	252,683	222,384
5	Randolph	5	224,758	4	297,011	6	219,762	5	209,656	5	218,774	5	230,194	5	243,012	4	314,842	4	354,830	245,874
6	Henry	6	144,139	6	137,258	8	125,962	8	84,473	9	99,058	9	78,551	8	76,023	10	68,261	9	81,373	102,237
7	Putnam	7	123,526	7	134,984	7	145,641	7	119,832	7	111,572	8	85,052	7	101,330	7	121,932	7	126,673	111,403
8	Vernon	8	64,303	8	119,036	5	234,376	3	297,599	4	237,965	4	303,886	4	281,894	5	252,134	5	298,382	212,192
9	Barton	9	63,026	9	108,784	9	61,301	10	55,767	10	76,242	12	37,570	9	70,554	8	104,253	11	67,844	71,041
10	Grundy	10	28,983	13	28,670	12	35,770	12	35,000	12	37,200	10	41,000	11	35,402	12	39,974	13	39,633	34,523
11	Linn	11	28,036	11	35,588	10	48,302	9	71,807	8	100,179	7	92,022	10	67,895	9	83,041	10	72,061	63,236
12	Boone	12	23,577	14	21,058	14	25,602	17	19,038	14	21,090	15	20,428	18	14,127	16	16,780	14	29,665	21,226
13	Caldwell	13	22,661	10	38,353	13	29,020	14	22,869	16	17,876	16	19,780	16	20,000	14	23,000	15	28,000	24,067
14	Andrain	14	19,599	12	29,792	11	42,262	11	43,910	11	40,918	11	37,611	12	35,167	13	36,498	12	40,759	35,930
15	Adair	15	17,110	17	14,820	16	20,957	15	20,744	13	24,540	13	23,510	13	27,078	11	62,215	8	104,868	33,068
16	Callaway	16	15,581	15	16,551	15	23,961	13	23,223	15	18,771	14	22,182	15	20,152	15	21,261	17	22,356	20,241
17	Montgomery	17	13,124	16	16,039	17	15,923	19	12,175	18	10,900	18	10,736	17	15,300	26	2,740	27	2,670	11,422
18	Johnson	18	10,530	18	10,485	18	12,101	18	15,427	19	8,873	24	3,961	23	3,770	21	4,318	23	4,710	8,735
19	Clay	19	8,289	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	Saline	20	7,961	22	4,440	26	1,865	29	1,875	23	4,000	20	6,500	19	9,000	39	1,500	20	8,000	6,833
21	St. Clair	21	3,866	21	5,405	21	6,517	22	5,337	21	5,487	23	4,058	21	5,452	23	3,596	25	4,210	4,861

22	Dade.....	22	3,402	30	6,881	20	6,685	27	2,521	22	5,000	21	6,065	24	2,769	33	1,000	29	2,350	2,396
23	Nodaway.....	23	2,222	26	1,850	24	2,548	25	2,984	29	1,802	31	750	34	250	36	514	36	320	1,741
24	Cooper.....	24	2,200	24	3,666	23	2,892	26	2,639	27	2,492	21	1,120	.....	22	3,794	22	3,704	19	8,600
25	Oole, average 7 years.....	25	2,000	27	1,548	27	1,200	28	2,000	22	1,590	28	1,863	27	2,178	32	1,244	30	2,116	1,783
26	Oedar.....	26	1,284	23	4,181	33	890	33	730	31	1,590	28	1,868	33	355	29	3,468	24	4,517	1,863
27	Charlton.....	27	1,170	25	2,312	28	1,136	34	185	28	1,868	33	.....	.....	1,573	24	.....	.....	.....	.....
28	Jasper.....	28	633	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
29	Ralls.....	29	614	32	280	25	2,160	23	4,400	20	8,489	19	9,644	20	7,843	18	7,798	18	16,014	5,779
30	Sullivan.....	30	560	19	8,800	31	1,000	21	6,600	34	1,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
31	Pettis, average 5 years.....	31	.....	31	433	34	181	30	1,738	.....	.....	.....	30	1,470	19	5,400	26	3,200	1,791	.....
32	Monteau.....	31	476	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
33	Schuyler.....	32	280	30	766	32	682	24	3,556	30	1,620	26	2,440	28	2,022	25	2,921	21	5,304	1,967
34	Livingston.....	33	200	29	1,000	30	1,000	32	800	33	1,050	29	1,155	31	1,468	27	1,817	34	900	1,039
35	Miller.....	34	130	33	127	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36	Morgan.....	35	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31	1,440	.....	.....	.....	.....
37	Monroe.....	36	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28	1,810	33	960	466	.....
38	Shelby.....	37	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
39	Carroll, average 7 years.....	.....	.....	28	1,380	29	1,088	31	920	26	2,664	27	2,304	28	2,225	34	803	28	2,397	1,724
40	Jackson, average 6 years.....	.....	.....	.....	.....	22	4,819	20	6,720	17	14,632	17	18,000	14	21,028	17	15,000	16	25,125	13,212
41	Howard, average 3 years.....	.....	.....	.....	.....	.....	.....	.....	.....	25	3,460	25	3,220	25	2,240	.....	.....	35	456	2,344
42	Cass, 3 years.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	1,000	33	1,206	29	1,536	31	1,321	1,267
.....	Totals.....	.....	2,650,018	.....	3,017,285	.....	3,190,442	.....	2,383,322	.....	2,283,081	.....	2,420,147	.....	2,429,368	.....	2,888,162	.....	3,191,811	.....

LIST OF PROPRIETORS AND OPERATORS.

ADAIR COUNTY.

Proprietor.	Operator.	Postoffice address.
American Fuel Co.....	American Fuel Co.....	Stahl.....
Malwald, Chas.....	Chas. Malwald.....	Novinger.....
Rombauer Coal Co.....	Rombauer Coal Co.....	Kirkville.....
Scott, D. C.....	D. C. Scott.....	Stahl.....
Stroup, J. F. & F. A.....	J. F. & F. A. Stroup.....	Kirkville.....
The North Missouri Coal Co.....	North Missouri Coal Co.....	Bevier (Macon Co.)...
Watson Coal Co.....	Watson Coal Co.....	

AUDRAIN COUNTY.

Carr, P.....	Parris Carr.....	Benton City.....
Farber Coal Co.....	Lawder & Peterson.....	Farber.....
Fisher, G. T.....	G. T. Fisher.....	Mt. Carmel.....
Hafner, O. F.....	O. F. Hafner.....	Worcester.....
Laddonia Coal Co.....	A. W. Judy.....	Laddonia.....
McGuire, Mrs. Martha.....	G. W. McGuire.....	Martinsburg.....
Standard Coal Co.....	Henegar, Thomas & Henegar.....	Vandalia.....
Taylor, W. F.....	Oscar Krieger.....	Martinsburg.....
Vandalia Coal Brick.....	Vandalia Coal & B. Plant.....	Vandalia.....
Vandalia Coal Co.....	Vandalia Coal Co.....	Wellsville.....
Wellsville Coal Co.....	Wellsville Coal Co.....	

BARTON COUNTY.

Adams, T. R. B.....	Kizer & Brown.....	Liberal.....
Bell, J. W.....	J. W. Bell.....	Lamar.....
Betz, John.....	John Betz.....	Liberal.....
Boulware Bros.....	John H. Lavery.....	Newport.....
Cook, W. P.....	W. T. Roads.....	Liberal.....
Divine, W. B.....	W. B. Divine.....	Liberal.....
Gardner, D. E.....	D. E. Gardner.....	Liberal.....
Gilkey, Edward.....	T. Simpson.....	Liberal.....
Hanshaw, W. H.....	W. H. Hanshaw.....	Liberal.....
Hines, Richard.....	H. E. Bailey.....	Liberal.....
Jones, Isaac.....	Webster & Boyer.....	Liberal.....
Joyce, A. H.....	Campbell & Watkins.....	Roston.....
Lasley, M.....	Lasley & Claunch.....	Minden Mine.....
Miller, W. L.....	S. W. Knecht.....	Liberal.....
Prosser, John J.....	John J. Prosser.....	Liberal.....
Short, Josiah.....	Joshia Short.....	Minden Mine.....
Spear, M. M.....	M. M. Spear.....	Lamar.....
Still, W. H.....	W. H. Still.....	Boston.....
Strambo, D. D.....	D. D. Strambo.....	Newport.....
Travis, Joseph.....	Joseph Travis.....	Liberal.....
Waiser, G. H.....	Thomas Andrews & Boyer.....	Liberal.....
Waltman, J. H.....	P. E. Waltman.....	Lamar.....
The Wear Coal Co.....	The Wear Coal Co.....	Pittsburg, Kansas...
Williams, W. H.....	W. H. Williams.....	Boston.....

BATES COUNTY.

Proprietor.	Operator.	Postoffice address.
erman, Jas.	Jas. Ackerman	Hume
ler, N.	N. Bellier	Rich Hill
ce-Rees Coal Co.	Bruce-Rees Coal Co.	"
er, Benj.	Benj. Cooper	Amsterdam
ler Bros.	Denier Bros.	Rich Hill
Coal Co.	Gee Coal Co.	"
gs, J. O.	J. C. Griggs	"
ridge, G. H.	G. H. Gutridge	Spruce
es Bros.	Hines Bros.	Rich Hill
gh & Stringer	Hough & Stringer	Worland
ram & Co.	Ingram Co.	Rich Hill
gcake & Hesse	Langecake & Hesse	"
der, W. H.	W. H. Lowder	"
tin, F. M.	F. M. Martin	Rich Hill
ller, Willis	G. B. Pettit	Foster
mpia Coal Co.	J. M. Tatley	Worland
erson, Robt.	Robt. Pearson	Rich Hill
erson, Peter	Peter Pearson	"
kin, J. O.	J. C. Rankin	Worland
d, Jerry	Jerry Reed	Amsterdam
n Hill Coal & Mining Co.	Rich Hill Coal & Mining Co.	Rich Hill
verner & Co.	Scrivner & Co.	Foster
w & Thurman	Morrell & Fortney	Hume
w, C. A.	O. A. Shaw	"
ver & McMullier	Stover & McMullier	Foster
telotte, A.	A. Turtelotte	Rich Hill
nut Coal Co.	Walnut Coal Co.	Foster
nut Creek Coal Co.	W. H. Mace & Co.	"
stern Coal & Mining Co.	Pryor & Bendure	Worland
stern Coal & Mining Co.	Henry Washburn	"

BOONE COUNTY.

ter Bros. Coal Co.	Carter Bros. Coal Co.	Columbia
umbia Coal Co.	R. E. Henry	"
don, Scott	S. D. Gordon	"
d, T. B.	T. B. Hord	Harrisburg
ne, Jas. H.	Jas. H. Keene	Columbia
ng, Thos.	Thos. Long	Harrisburg
Kenzie, Robt.	Robt. McKenzie	"
Kenzie, Mrs. Lydia A.	N. B. McKenzie	"
gs, Thos.	Thos. Rees	Columbia
as, J. S.	J. S. Sims	Perche
sham, W. A.	W. A. Stidham	Harrisburg
ne, Jas. W.	Jas. W. Stone	Perche
lte, Wm. & J. S.	J. H. White	Rucker
itmarsh, Chancey	C. Whitmarsh	Harrisburg
ring Mine	Sidney Creed	Columbia

CALDWELL COUNTY.

dwell Coal Co.	Caldwell Coal Co.	Hamilton
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CALLAWAY COUNTY.

stle, Wm.	Castle, Wm.	Fulton
ton Fire Brick & Mining Co.	Fulton F. B. & Mining Co.	"
rris, John	John Harris	"
ng, John G.	John G. King	"
rsenkoff, John	John Marsenkoff	"
ith Mine	J. W. Simmons	"
ith, James	James Smith	"

CARROLL COUNTY.

Proprietor.	Operator.	Postoffice address.
Cunningham Mine.....	J. B. & M. E. Cunningham.....	Carrollton.....
Hughes, Wm.....	W. J. White.....	Little Compton.....
Klondyke Mining Co.....	H. D. Anwater.....	" ".....
Ogle, W. F.....	W. F. Ogle.....	" ".....
Scott, Wilson.....	Chas. Ducate.....	Carrollton.....
Whitehead, James.....	Chas. Frost.....	Hale.....

CASS COUNTY.

Oreighton Coal Co.....	Geo. Meldinger.....	Oreighton.....
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CEDAR COUNTY.

Bouker, Nellie.....	Edward Beebe.....	Lebeck.....
Connor, Jas.....	Jas. Connor.....	Jerico.....
Dial, Mrs. Jane.....	Deal & Connor.....	Filley.....
Duncan, J. O.....	J. C. Duncan.....	Jerico.....
Floyd, J. N.....	J. N. Floyd.....	Lebeck.....
Lloyd, Mrs. R. A.....	N. D. W. Floyd.....	Jerico.....
McLeod, J.....	Intermill & Bridgwater.....	".....
Poague, Mine.....	G. M. Poague.....	".....
Schroeder, C. M.....	C. M. Schroeder.....	El Dorado Springs....
Filley Mine.....	J. H. Young.....	Filley.....

CHARITON COUNTY.

Applegate, L. L.....	L. M. Finnell.....	Keytesville.....
Benecke, L.....	C. H. Owen.....	Brunswick.....
Buffington, T. P.....	T. P. Buffington.....	Keytesville.....
Cooley, J. M.....	J. M. Cooley.....	".....
Harr, J. L.....	J. L. Harr.....	Brunswick.....
Huentin, John.....	Robt. Bruer.....	Guthridge Mills.....
Isle, R. W.....	R. W. Isle.....	Indian Grove.....
Kahler, V.....	V. Kahler.....	Newcomer.....
Kennedy, J. W.....	J. W. Kennedy.....	Brunswick.....
Wacter, Henry.....	Briggs & O'Donnell.....	Salisbury.....

CLAY COUNTY.

Missouri City Coal Co.....	Missouri City Coal Co.....	Missouri City.....
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COLE COUNTY.

Kaufman & Robben.....	Kaufman & Robben.....	Elston.....
Knernscheid & Son.....	Knernscheid & Son.....	".....
Leonard Mine.....	Abe Schull.....	Centertown.....

COOPER COUNTY.

Hazell Springs Coal Mine.....	Chas. W. Hazell.....	Boonville.....
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DADE COUNTY.

Proprietor.	Operator.	Postoffice address.
Allen, Wm.....	Leonard & Allen.....	Sylvania.....
Finney Mine.....	Finney & Simmons.....	".....
Gardner, Wm.....	F. H. Gardner.....	".....
Johnston, Jas.....	John Stephenson.....	".....
McCluey, Robt.....	Robt. McCluey.....	".....
Rector Mine.....	Frank Farmer.....	".....
Seaton, J. R.....	G. W. Hendricks.....	".....
Waterberry, W. S.....	Gardner & Harwick.....	".....

GRUNDY COUNTY.

Grundy Co. Coal Co.....	Grundy Co. Coal Co.....	Trenton.....
Medicine Valley Coal Mine.....	Medicine Valley Coal Co.....	Gault.....

HENRY COUNTY.

Blair, J. J.....	Cooper Creek Coal Co.....	Brownington.....
Bowen, R. & Son.....	R. Bowen & Son.....	Clinton.....
Burgess, L. L.....	L. L. Burges.....	Piper.....
Chappell, J. R.....	C. W. Field.....	Windsor.....
Co-operative Coal Co.....	Co-operative Coal Co.....	Lewis Station.....
Daley, R. B.....	Ed. Allison.....	Clinton.....
Clark, David.....	David Clark.....	Montrose.....
Dickey, W. S., Clay Mfg. Co.....	W. S. Dickey Clay Mfg. Co.....	Deepwater.....
England, Wm.....	Wm. England.....	Clinton.....
Geahart, Theo.....	Theo. Geahart.....	Sparrow.....
Hughes, W. E.....	W. E. Hughes.....	Windsor.....
Hunt, W. R.....	W. R. Hunt.....	Piper.....
Hurst, Mrs. J. W.....	Mrs. J. W. Hurst.....	Deepwater.....
Hurst, John.....	John Hurst.....	".....
Jenkins, W. H.....	W. H. Jenkins.....	Calhoun.....
Jones, J. B.....	J. B. Jones.....	Montrose.....
Jordan Coal Co.....	Jordan Coal & Coke Co.....	Clinton.....
Langley, W. H.....	W. H. Langley.....	Montrose.....
Long, George W.....	George W. Long.....	Urich.....
Meranda, W. T.....	W. T. Meranda.....	Deepwater.....
Miller, W. J.....	T. A. Beaman.....	Windsor.....
Pharis Coal Co.....	T. A. Pharis.....	Deepwater.....
Raybourn, D. C.....	D. C. Raybourn.....	Piper.....
Reese, Wm., Jr.....	Wm. Reese, Jr.....	Deepwater.....
Reese, Wm., Sr.....	Wm. Reese, Sr.....	".....
Smith Coal Co.....	J. W. Smith.....	".....
Stockton, Mrs. S. B.....	Mrs. S. B. Stockton.....	Clinton.....
Thompson & Co., John.....	Jno. Thompson & Co.....	Brownington.....
Tyree, Jos.....	Jos. Tyree.....	Montrose.....
Watkins, J. P.....	J. P. Watkins.....	Clinton.....
Young, L. P.....	L. P. Young.....	Garland.....

HOWARD COUNTY.

Fayette Coal Mine.....	Richard S. Jackson.....	Fayette.....
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JACKSON COUNTY.

Brush Creek Coal & Mfg. Co.....	Brush Creek Coal & Mfg. Co.....	Kansas City.....
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JOHNSON COUNTY.

Proprietor.	Operator.	Postoffice address.
Barrowman Mine.....	John Barrowman.....	Bristle Ridge.....
Black Diamond C. & M. Co.....	S. E. Hanna.....	Montserrat.....
Bullock, P. H.....	P. H. Bullock.....	".....
Hedgecock, Isaac.....	Isaac Hedgecock.....	Dunksburg.....
Highley, John.....	Jas. Fletcher.....	".....
Meiley, M. B.....	M. B. Meiley.....	Warrensburg.....
Northrup Mine.....	Moses McDaniel.....	".....
Northrup, Mary.....	Geo. Northrup.....	".....
Parks, Wilson.....	Jas. Fletcher.....	Dunksburg.....

LAFAYETTE COUNTY.

Bartles, Edward.....	Reuben Green.....	Concordia.....
Bell, W. H.....	H. Barrow.....	Corder.....
Bell & Greer.....	Bell & Greer.....	Lexington.....
Bonanzo Coal Co.....	S. W. Brandon.....	Higginsville.....
Chanslor, Clark A.....	C. A. Chanslor.....	Lexington.....
Consolidated Farmers' C. C. Co.....	Consolidated Farmers' Coal Co.....	Higginsville.....
Corder Coal Co.....	Corder Coal Co.....	Corder.....
DeBolt, J. H.....	J. H. DeBolt.....	".....
Diamond Coal Co.....	Diamond Coal Co.....	".....
Dover Coal Co.....	Dover Coal Co.....	Lexington.....
Dieckhoff, H. J.....	H. J. Dieckhoff.....	Alma.....
Farmers' Coal Co.....	Farmers' Coal Co.....	Higginsville.....
Frerking, Henry F.....	Schroeder & Mueller.....	Concordia.....
Gaffin, O. M.....	O. M. Gaffin.....	Lexington.....
Geisendorfer, S. F.....	S. F. Geisendorfer.....	Corder.....
Grim, John H.....	John H. Grim.....	Higginsville.....
Haygood Coal Co.....	Price Gunn.....	".....
Hendrix, Mrs. S. B.....	Rust Bros.....	Concordia.....
Hoffman, E. Y.....	E. Y. Hoffman.....	Higginsville.....
Klonkyke Coal Co.....	Rush & Reed.....	Corder.....
Kresse, A. F.....	A. F. Kresse.....	Concordia.....
Labor Exchange No. 305.....	Labor Exchange.....	Wellington.....
Lexington Coal & Mining Co.....	Lexington Coal & Mining Co.....	St. Louis.....
Longest, John R.....	J. S. Stevenson.....	Higginsville.....
Looney, J. H.....	J. H. Looney.....	Kansas City.....
McGrew, J. C.....	J. C. McGrew.....	Lexington.....
Macey, Henry.....	Henry Macey.....	Kansas City.....
Mack, Herman E.....	Herman E. Mack.....	Lexington.....
Morgan Mine.....	W. P. Morgan.....	Corder.....
Mirrison-Wentworth Bank.....	Aull & Serrat.....	Lexington.....
Parker, M.....	Henry Bartels.....	Concordia.....
Perry, Thomas.....	Thomas Perry.....	Bates City.....
Rosewell Bros.....	James Rosewell.....	Lexington.....
St. Clair, Harry.....	Harry St. Clair.....	Greenton.....
Salt Fork Coal Co.....	Salt Fork Coal & Mining Co.....	Corder.....
Sebastian Coal Co.....	A. F. Sebastian & Sons.....	Mayview.....
Spruce, Seth.....	Seth Spruce.....	Lexington.....
Strausburg & Son.....	Strausburg & Son.....	Mayview.....
Summers, M. W.....	M. W. Summers.....	Alma.....
Walton, Thomas.....	John & Thomas Walton.....	Lexington.....
Waverly Coal & Mining Co.....	Allen-Waverly Coal Co.....	Waverly.....
Wellington Coal Mining Co.....	Wellington Coal Mining Co.....	Kansas City, Mo.....
Woskoski, M.....	M. Woskoski.....	Higginsville.....

LINN COUNTY.

Brookfield Coal Co.....	Brookfield Coal Co.....	Brookfield.....
Landreth & Sons.....	Landreth & Sons.....	Marceline.....
McElhaney & Burdell.....	Crandall & Barr.....	Brookfield.....
Marceline Coal Co.....	Marceline Coal Co.....	Marceline.....
Schaeffer, Bernard.....	Bernard Schaeffer.....	Brookfield.....
Williams, L. R.....	L. R. Williams.....	".....

LIVINGSTON COUNTY.

Cox, W. A.....	W. A. Cox.....	Chillicothe.....
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MACON COUNTY.

Proprietor.	Operator.	Postoffice address.
Bevier Black Diamond.....	Bevier Black Diamond.....	Bevier.....
James & Sons.....	Levi James.....	".....
Kansas & Texas Coal Co.....	Kansas & Texas Coal Co.....	St. Louis.....
Little Pittsburg Coal Co.....	Little Pittsburg Coal Co.....	Lingo.....
Northwestern Coal Co.....	Northwestern Coal Co.....	Bevier.....
Richmond, J. G.....	S. R. Davis.....	College Mound.....
Rowland, Peter F.....	Peter F. Rowland.....	Macon City.....
Thomas, R.....	R. Thomas.....	Bevier.....
Vose, David.....	David Vose.....	La Plata.....
Watson Coal Co.....	Watson Coal Co.....	Bevier.....

MONROE COUNTY.

Greer, W. T.....	W. T. Greer.....	Paris.....
Montgomery, W. J.....	Wm. J. Montgomery.....	".....
Trussell, Henry.....	Henry Trussell.....	".....

MONTGOMERY COUNTY.

B. D. Coal Co.....	B. D. Coal Co.....	Wellsville.....
Whitehead, Henry.....	Henry Whitehead.....	".....

NODAWAY COUNTY.

Carpenter Mine.....	J. C. Pearson.....	Quitman.....
Davis, S.....	S. Davis.....	".....
Gordon, Geo. W.....	Jacob Bigley.....	".....

PETTIS COUNTY.

Stevens, B. F.....	A. Carson.....	Hughesville.....
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PUTNAM COUNTY.

Blackbird Block Coal Co.....	Lane & Jordan.....	Blackbird.....
Emporia Coal Co.....	John J. Price & Bro.....	Unionville.....
Guffy, Alexander.....	Alex. Guffey.....	".....
Leck, John.....	John Leek.....	Mendota.....
Mendota Coal & Mining Co.....	Mendota Coal & Mining Co.....	".....
Nogle, John.....	Boyd & Patterson.....	Unionville.....
Rogers Bros.....	John & Wm. Rogers.....	Pearl City, Iowa.....
Star Coal Co.....	Star Coal Co.....	".....

RALLS COUNTY.

Adkinson, John.....	John Adkinson.....	Perry.....
Fitzpatrick Bros.....	Fitzpatrick Bros.....	".....
Ralls County Coal Co.....	Ralls County Coal Co.....	".....

· RANDOLPH COUNTY.

Proprietor.	Operator.	Postoffice address.
Bradley, D. T.	D. T. Bradley	Elliott
Brown & Wellsby	Brown & Wellsby	Renick
Cooper & Shackhouse	A. B. Cooper & Co.	Moberly
Dean, H. M.	H. M. Dean	Jacksonville
Elliott Coal Co.	Elliott Coal Co.	Elliott
Enterprise Coal Co.	John Cronan	Moberly
Highbee Coal & Mining Co.	Highbee C. & M. Co.	Highbee
Hudson, D. M.	D. M. Hudson	Grand Centre
Hunt Coal Co.	Hunt Bros.	Huntsville
Huntsville Coal Co.	Huntsville Coal Co.	"
Interstate Mining Co.	Interstate Mining Co.	Highbee
Jones & Davis	Jones & Davis	Moberly
Lewis, J. J.	J. J. Lewis	Huntsville
Mitchell, W. E.	W. E. Mitchell	"
Morris, John	J. L. Morris	Renick
Robinson, J. L.	J. L. Robinson	Huntsville
Ward, Harry	Harry Ward	Moberly

RAY COUNTY.

Blair, Andrew	Andrew Blair	Richmond
Bryan, J. B.	F. Bucklinger	Lakeview
Chenault, A. R.	A. R. Chenault	Henry
Climax Mine	W. H. Blunt	Ovid
Chrispen, Chas.	Chas. Chrispen	Richmond
Duncan, Henry	Wm. Sickles	Lakeview
Hayson, Robt.	Robt. Hayson	Richmond
Hubbell & Fisher	Hubbell Coal Co.	"
Huston, F.	F. Huston	Lakeview
Kallenberger, Jno. J.	Jno. J. Kallenberger	"
Kansas & Texas Coal Co.	Kansas & Texas Coal Co.	St. Louis
King, R. A.	Jas. Dorne	Hardin
Loeven, Jos.	Jos. Loeven	Lakeview
Marshall Heirs.	Jas. M. Edgar	"
Mercantile Coal Co.	Mercantile Coal Co.	St. Joseph
Mosby Bros.	Mosby Bros.	Camden
Pence & Colnen	Pence & Colnen	Richmond
Pence Bros.	Pence Bros.	Camden
Pickering Coal Co.	Pickering Coal Co.	Richmond
Rankin Coal Co.	Rankin Coal Co.	"
Ray Co. Br., T. & Coal Co.	W. J. Lynch	Lakeview
Richmond & Camden Coal Co.	R. & C. Coal Co.	Richmond
Sevier, Chas.	Ottman & Swopes	"
Starr, Alex.	P. F. Smith	Hardin
The Major Grimes Mine	Hugh Blair	Knoxville
The Williams Coal Co.	R. J. Williams	Swanwick

ST. CLAIR COUNTY.

Allison, R. W.	R. W. Allison	Taberville
Olapp, W.	W. Clapp	Appleton City
Egger, J. B.	Wm. Howard	"
Griggs, L. L.	L. L. Griggs	Lowry City
Knerim, John	Knerim Bros.	"
Lewellyn, Mrs. Sarah	J. M. Fitch	Ohio P. O.
McColey, W. F.	W. F. McColey	Appleton City
Mims, C.	C. Mims	Iuka Springs
Oliver, Alex.	Oliver Bros.	Appleton City
Pharis, H. L.	J. A. Mathews	Dottle
Pratt, Joel	Harry T. Pratt	Appleton City
Seymore, W. A.	W. A. Seymore	Osceola
Short Mine	J. M. Short	Iuka Springs
Wooden, H. M.	H. M. Wooden	Dottle

SALINE COUNTY.

Proprietor.	Operator.	Postoffice address.
Highly & Lambert.....	Highly & Lambert.....	Dnksbury.....
Strucker, Fred.....	Fred Strucker.....	".....
Terrel, Henry C.....	John Brady.....	Elwood.....
Whitaker, Mark.....	M. Whitaker.....	Miami.....

SCHUYLER COUNTY.

Golston, Jno.....	Jno. Golston.....	Queen City.....
Mock, T. J.....	T. J. Mock.....	Zola.....
Mock, A. J.....	A. J. Mock.....	".....
Zola Coal Co.....	Lewis Bradburn.....	".....

VERNON COUNTY.

Arthur Coal Co.....	Hudson & Williams.....	Arthur.....
Auger, B. F.....	Frank Zaner.....	Moundville.....
Baker, Frank.....	Frank Baker.....	Sheldon.....
Bedford Coal Co.....	D. Hughes.....	Panama.....
Bryan, Geo. F.....	Geo. F. Bryan.....	Carbon Center.....
Central Coal & Coke Co.....	Central Coal & Coke Co.....	Kansas City.....
Collett, Geo.....	Geo. Collett.....	Harwood.....
Dunn, Edwin.....	Edwin Dunn.....	".....
Hill Mine.....	F. B. Auger.....	Moundville.....
Jones, P. W.....	David Perkins.....	".....
Lowe, J. A.....	J. A. Lowe.....	Milo.....
Maybury, F. M.....	F. M. Maybury.....	Harwood.....
Moss Bros.....	Moss Bros.....	".....
Radde, F. M.....	F. M. Radde.....	".....
Rich Hill Coal & M. Co.....	R. H. Coal & Mining Co.....	Rich Hill.....
Roach, T. N.....	T. N. Roach.....	Walker.....
Smith, E. F.....	P. G. Smith.....	Ketterman.....
Still, J. W.....	J. W. Still.....	Walker.....
Vernon Coal Co.....	Vernon Coal Co.....	Rich Hill.....

BUREAU OF
MINES, MINING AND MINE INSPECTION.

CHAS. EVANS,
Inspector of Coal Mines.

GEO. E. QUINBY,
Inspector Lead and Zinc Mines.

GENERAL OFFICE JEFFERSON CITY, MO.
J. W. MARSTELLER, Sec'y and Ass't Inspector.

BUREAU OF MINES, MINING AND MINE INSPECTION.

Heretofore the inspector of coal mines and the inspector of lead and zinc mines, have each, in accordance with law, made their respective reports to the Labor Commissioner, and were in a way considered as subordinates to the commissioner. The rapid growth and extreme activity of late experienced in our mining industries, clearly pointed to the necessity for a separate bureau; this fact becoming more and more apparent our last Legislature created the separate department. The law creating the same provided for the appointment by the Governor of two inspectors, one for coal mines and the other for lead, zinc and mines other than coal mines, it also provided for a joint assistant who in turn is appointed by the inspectors. The inspectors make annual reports but the two reports are issued under one cover to avoid expense.

The statistical tables as formerly used will be continued as they answer well all purposes, then a further and prime reason for retaining them is to preserve that uniformity in the tables so necessary to parallel comparison of statistics one year with another. The definite character of the data secured by the inspectors should recommend the statistics furnished by them, for the reason that companies and individuals operating mines are required by law to make an annual report to the inspectors on blanks specially prepared and furnished by them to the operators.

In order to convey a more comprehensive idea of the combined mining industries of our state, we have prepared the following table to show in condensed form, the extent of our mining district, the number of men employed in and about our mines and the valuation of the product, its growth and increase.

For the year ending June 30, 1899.		Coal.....	Lead and zinc.....	Total 1899....	Total for 1898, coal, lead and zinc....	Increase over the fiscal year 1898.....	Per centage of increase..
Number of counties producing.....	36	15	51	48	3	.06%	
Number of shafts operated.....	369	1,001	1,370	1,038	232	22.43	
Number of miners employed.....	6,294	6,002	12,296	10,217	2,079	20.35	
Number of other employees.....	1,498	3,617	5,115	2,935	2,180	74.27	
Total number of employees.....	7,792	9,619	17,411	13,152	4,269	32.38	
Fatal accidents.....	14	27	41	38	3	.08	
Non-fatal accidents.....	23	19	42	43	.....	.....
Total accidents.....	37	46	83	81	2	2.47	
Total receipts from sale of.....	\$3,582,111	\$9,130,861	\$12,702,972	\$9,067,241	\$3,615,731	39.81	

From the foregoing table it will be observed that the increase in the value of the combined output of our coal, lead and zinc mines over last year was nearly 40 per cent. The increase for coal having been 13½ per cent, that of lead 8 2-3 per cent, and zinc 102, per cent. The importance of our mining interests and the volume of the business may be still further appreciated when it is understood that the value of our mine products is greater than the combined value of the following surplus shipments of farm products: Wheat, corn, oats, hay, cotton, tobacco, flax, timothy, clover and cotton seeds, with all the fruit and vegetable shipments of the state thrown in.

The demand for our annual report this year, due doubtless to the unusual mining excitement, can not possibly be supplied owing to the meagre appropriation made for printing. No industry or enterprise within our borders has attracted more interest or as much capital to the state as our mining industries have, and it is particularly unfortunate that the inspectors are prevented from thus advertising so effectively our resources. There are demands as a result of our advanced position as a rich mineral producing state, that should enlist the earnest consideration of every legislator, and such provision made to maintain our advancing interests as their importance warrants and justifies.

The inspectors feel that they would do themselves an injustice should they fail to express their thanks for the creation of the Bureau of Mines and Mine Inspection, whereby their field of usefulness is enlarged and dignified. In no feature of the change, however, have they greater reason for gratification than in the fact that they now have the undivided assistance of Mr. J. W. Marsteller, who has served them so long, so faithfully and so very satisfactory.

REPORT ON
LEAD AND ZINC

For Year Ending June 30, 1899.

GEO. E. QUINBY, Inspector.

STATE OF MISSOURI, BUREAU OF MINES, MINING AND MINE INSPECTION, }
CITY OF JEFFERSON, NOV. 15, 1899. }

HON. LON. V. STEPHENS, Governor:

SIR—In obedience to the requirement of law, I have the honor to submit the Thirteenth
Report on lead, zinc, iron and mines other than coal and to remain

Your obedient servant

GEO. E. QUINBY, Inspector.

INTRODUCTORY.

In presenting this the Thirteenth Annual Report of the zinc and mining industry of Missouri, there are many new features claiming attention that mark the fiscal year closing June 30, 1899, as the most remarkable in the history of the mining industry of the state and place this year far in advance of even the remarkable record made the year 1898. During this year the great zinc and lead fields of Missouri have assumed prominence in the eyes of the world not anticipated by even the best informed and far-sighted citizens and the advance in both production and prices has been tremendous while the methods of operating have undergone almost a complete change as far as the use of machinery is concerned. The old hand system of cleaning the ore is passing rapidly away and except in the development of new mines where the extent of the ore runs are a more or less uncertain quantity, the hand jig is seldom seen. In our opinion it would be a conservative estimate to say that at least \$10,000,000 of eastern and foreign capital outside the state have been invested in the mines of Missouri since the close of the last fiscal year and the advent of this capital has been followed by the introduction of new and progressive methods. New mills are springing up on every hand. The pumping systems are being brought to the highest state of efficiency and valuable and productive properties that had been condemned and abandoned in the past on account of the heavy volume of water to contend with are now being reclaimed and are adding immensely to the output of the districts. The enormous increase in the number of steam mills has concentrated the industry in fewer hands and made it possible for the producers of zinc ore to regulate the output and protect themselves from sudden and disastrous fluctuations in the market and the result has been that prices for ore have advanced steadily and have been maintained throughout the year at prices before hardly dreamed of. These results have been largely achieved by the Missouri and Kansas Zinc Miners' Association which was formed last December

and which has steadily added to its membership until at the present time about ninety per cent of the ore producers are members of the association. The association has a large fund raised by assessment on the sales of ore belonging to the members and they keep closely in touch with the metal and ore markets of the world and are prepared at any time to make large shipments of ore abroad whenever the domestic market is threatened with a surplus. The constant, steady rise in values and the enormously increased demand for zinc ore has turned the attention of investors to the Southwest Missouri district and the enormous profits made in the industry and its strictly legitimate character have made zinc stocks a favorite with capitalists and large bodies of the choicest mineral lands in the state have passed into the hands of non-residents who were quick to perceive the opportunities to which the capitalists of our own state were apparently blind.

There are many reasons for the enormously increased demand for American zinc ore and spelter but aside from the rapidly increasing use of zinc, the demand is largely due to the superior quality of Missouri zinc ores and also the spelter made from it. There is no district either in the United States or the world where the ore is of so high metallic value as in the zinc mining districts of Missouri and there is no place where so high a grade of ore can be produced so cheaply. Colorado and all western zinc ores contain component parts of objectionable matter that can not be eliminated in the process of reduction and whose presence in the spelter manufactured from it, greatly depreciates its value. The methods of cleaning the ore in this country are greatly superior to those employed abroad and the shallow depth at which the ore is found in the various districts of Missouri, the low cost of machinery needed to clean it and the consequent low cost of production with its high grade make it a formidable competitor to the inferior ore produced abroad where the great and constantly increasing depth at which it is mined adds continually to the cost of production. That the mines of this country and the competition of American ore and spelter are causing anxiety to operators of Europe is shown by the visits paid to the Southwest Missouri district this year by foreign operators, among others, M. Paul de Sincay, the president and executive head of the noted Veille-Montagne Zinc Company of Belgium, said to be the greatest users of zinc ore in the world, who visited the Joplin and other districts early in August and spent some time investigating the ore deposits, the methods and cost of operation and the various reduction works using the zinc ores from these sections. He is said to have been greatly impressed with the district not only on account of its great productiveness and the richness of

the ore bodies but also with the system of mining and with the high class of miners employed here and the entire absence of conditions which produce labor disturbances, the latter feature appealing to him strongly on account of the great labor disturbances in the zinc industry of Belgium, which unsettled business for months and which was one of the causes leading up to the great demand for American ore this year.

One of the reasons for the greatly increased use of zinc is the fact that the architects of the country have been forced by the great increase in the cost of terne roofing plates, to look around for some other material and having investigated the adaptability of zinc, have found out that it is incomparably the best substitute and intrinsically a much better material for roofing than terne plates. The terne plate consists of a thin base of steel coated with a mixture of lead and tin and painted to protect the material of which it is composed and the objection to the plates as a roofing material is their present high and increasing cost and the fact that the paint soon scales off, thus exposing the mixture of lead and tin which then wears away rapidly and exposes the thin steel base which in turn rapidly oxidises to crust and the life of the plate is ended. On the contrary, the zinc shingle needs no paint to preserve it and the slight process of oxidization which follows exposure to the weather soon stops, the process itself making a natural impervious coating on which the action of the weather has no farther effect and giving to a roof covered with zinc a soft gray tint pleasing to the eye. The metal expands or contracts from the effects of heat or cold to a degree so well known and determined that a roof properly covered with zinc shingles with allowance made for expansion and contraction, makes the best roof possible to put on. It requires lighter roofing timbers than any other material and if at any time it is necessary to remove it, it is always worth very close to one-half its original cost as old metal. From reports there are buildings in Europe that were covered with zinc tiles more than a century ago and are still in good condition, and now that the architects of this country have commenced to investigate the advantages of this material and to recommend its adoption, there is no doubt that its use in this connection will be enormously increased. Another reason for the increased demand for zinc is the rapid increase in the cyanide process of treating gold ores. The demand is not only enormous at the present time but the opening of new and rich gold fields all over the world and the popularity and the effectiveness of the cyanide process is causing its adoption in many of the new mining fields opened up and the demand from this source alone bids fair to be doubled during

the next year. At the present time, it is said that not less than forty thousand tons of metallic zinc are consumed annually in the cyanide process in the South Africa gold fields alone and the metal literally passes out of existence as the process of reclaiming it would be more costly than the original price of the metal. In the manufacture of brass and galvanized iron and in the constantly multiplying demands from the electrical field as well as in the manufacture of domestic utensils, articles of ornament, white bronze, etc., the demand is constantly widening out and the indications are for a constantly increasing demand and higher values for years to come.

The investments made in zinc properties in Missouri by eastern capitalists have proven uniformly successful and a great stimulus to future investments has been given by the results of deep drilling which has demonstrated that the richest ore deposits are found below the 250 foot level and at and below the 500 foot level. There has been in the past so much controversy over the nature of the ore deposits that to partially settle the matter at least, the Crossman Brothers of Joplin who have been drilling all over the southwest for the past thirty years were induced to publish the record from their drill book for that period which they did in the form of a chart. The chart gives the result from 1,654 holes put down and shows that of all put down to a depth of 500 feet, seventy-five per cent struck larger bodies of ore and of far richer quality than any deposits developed near the surface. The theory among most geologists in the past has been that the ore deposits were the result of volcanic action in past ages and were simply surface deposits left in the earth's crust by seismic disturbances. Since the publication of the chart, Prof. W. P. Jenney, the eminent geologist who directed the United States' geological survey in this district several years ago has spent several weeks in Joplin investigating the Crossman drill records very elaborately and also the more recent developments by deep drilling and he is said as a result of his investigations to have arrived at the conclusion that there exists all over the southwestern district a regular sedimentary deposit occurring in well defined strata about two hundred feet apart, below the 250 foot level to a depth of over a thousand feet below the surface. It is understood that Prof. Jenny will publish a supplementary report embodying the result of his observations. The natural result of the publication of these records backed up as they are by the results of deep drilling since their publication is to assure investors in the Missouri zinc fields that while their money was well invested from surface indications, they secured at the same time an untold wealth of ore at the deeper levels of whose existence they were ignorant at the time

air investments were made. There seems to be no disposition on the part of the recent investors to change the methods of operating as far as the system of sub-leasing is concerned. This system offers the largest possible returns to the investor at a minimum of risk and also has the greatest advantage of making the miner independent of control except so far as he is bound by the conditions of his lease, thereby entirely eliminating any danger of labor disturbances on a large scale and making the mining population of the Missouri zinc fields the most intelligent of any in the world. The system has often been touched upon before but as each report reaches an ever increasing number of readers many of whom are learning of zinc mining for the first time, a brief description of the method will not be out of place. The method of developing mining lands in the past has usually been for the owners of the fee to divide the land into lots two hundred feet square which are leased to miners for terms ranging from one to five years on condition that the ground shall be worked continuously in a workman-like manner. The operators pay a royalty to the owners of the land usually of from ten to twenty-five per cent. The royalty on lead is often paid, based on the selling price in St. Louis or other markets. Under this system the individual operators assume all the risk of losses through failure to strike ore and when successful as they are in a majority of cases, the land owner receives a handsome income weekly without assuming any risk and absolutely without cost to himself.

At no time in the history of Missouri, has there been so much genuine activity in the hunt for the hidden minerals of the state, and no time have prospectors met with greater success than during the past twelve months. This energetic effort to reach the great wealth now known to exist beneath Missouri's soil is not confined alone to the southwest or to the southeast part of the state, but we find this activity reaching from the state's western border to the Mississippi river on the east and from the Missouri river to the state's extreme southern limits, and everywhere within the broad territory mentioned, we find zinc and lead ores to be uppermost in the mind of the citizen.

TABLE I—Lead and Zinc Mines.

Comparative table for the years 1898 and 1899 (fiscal year ending June 30).

	1898.	1899.	Increase.	Decrease.
Number counties producing lead and zinc ores.....	12	15	3	
Number shafts operated during the year.....	661	1,001	340	
Number tons lead ore mined during the year.....	73,687	70,829		2,858
Number tons zinc ore mined during the year.....	139,698	181,430	41,732	
Amount received for lead ore product.....	\$3,611,055	\$3,146,237	\$135,682	
Amount received for zinc ore product.....	\$2,927,321	\$5,974,024	\$3,047,403	
Total receipts from output of both lead and zinc.....	\$5,938,376	\$9,120,261	\$3,182,465	
Average price per ton received for lead ore.....	40.86	44.40	3.54	
Average price per ton received for zinc ore.....	20.86	34.33	13.37	
Total number of miners employed.....	4,910	6,002	1,092	
Total number of outside men employed.....	1,683	3,617	1,934	
Total number of men prospecting.....	1,016	1,378	362	
Total number of all employees.....	7,609	10,997	3,388	
Total number of employees fatally injured.....	29	27		2
Total number of employees non-fatally injured.....	16	19	3	
Total number of wives made widows.....	16	15		1
Total number of children made fatherless.....	51	41		10
Number of tons of ore mined for each life lost.....	7,357	9,343	1,986	

REPORT.

For the fiscal year ending June 30, 1899, we have a total output of 181,430 tons of zinc ore and 70,829 tons of lead ore, the valuation of which making the grand total of \$9,120,861.

Evidence of the exceptional activity experienced in the mining industries especially in that of zinc, may be noted in the astonishing increase of production and valuation when compared with last year or that of any preceding year. Last year the total value of the two ores amounting to \$5,938,379, compared with this year with \$9,120,861 the actual value shows an increase for the year of \$3,182,482, or 53.59 per cent.

This is a remarkable showing, but very much more so when we confine the comparison to zinc ore alone; for owing to a decline in the production of lead ore this year as compared with last year the general gain for both ores is made to suffer to that extent. Taking for comparison zinc ore by itself, we have an output this year valued at \$5,974,624, as against \$2,927,321 last year, the increase being \$3,047,003, or 104 per cent.

The production of lead ore this year did not respond to the increased price or keep pace with the activity experienced in zinc ore; in fact the output for this year shows a decrease compared with last year, there being mined but 70,829 tons as against 73,687 tons last year. This falling off of 2,858 tons, however, is more than offset by the increased price received for the product, and we find with this great difference in product, yet there is an increase of \$135,179 in valuation over the former year. The average price received for all grades of lead ore last year was \$40.86 while for this year the average was \$44.40 per ton, a net increase of \$3.54 per ton or eight and two-thirds per cent.

Just here an explanation is in order, as there exists a wide difference in the value of lead ores, especially as between the great lead producing district of Southeast Missouri where 77 per cent of the

entire product is mined and that of the Southwest. In Southeast Missouri the ore is not of as good a quality as it is in the other district; then again the operators of that district not only mine the ore but smelt it as well, prices being estimated for the ore based upon the average price received for pig lead. This year the estimated average value of the lead ore of Southeast Missouri was \$43.52 per ton.

In Southwest Missouri the prices given for lead ore are based upon actual sales. The average price received for high grade ore this year was \$47.44 per ton, with an average for all grades of \$47.13 per ton.

The counties of Jasper, Lawrence and Newton produce nearly 99 per cent of the entire zinc output of the state.

Jasper county stands pre-eminently first in importance with an output of both lead and zinc ores valued at \$5,476,920, last year its product amounted to \$3,085,795, showing an increase of \$2,391,125, or 77 per cent. The output and value of the zinc ore product of this county for the year is even more astonishing, for there being a shortage in the production of lead ore last year and the failure of lead prices to keep up with zinc prices, causes the general average increase for both ores to look comparatively modest when its zinc ore product and value is considered alone. For instance, its output of zinc ore last year was 108,161 tons which sold for \$2,430,357; this year its output has been 139,398 tons which sold for \$4,788,025; this shows an increased output of 31,237 tons and an increase in its value of \$2,430,357, or 103 per cent. The output of zinc in this county for the year is within 270 tons of equaling the largest output of zinc heretofore produced in the entire state.

Newton county had an increase of \$240,875 or 107 per cent.

Lawrence county had an increase of \$404,990, or 111 per cent.

In passing it may be well before leaving these remarkable increases to state that the data from which the above facts have been arrived at, is taken from reports required by law, made by the operators of the respective mines on blanks specially prepared and furnished by the inspector; such reports when returned to the inspector are carefully tested and verified in every way possible.

Heretofore many persons have been at a loss in the effort to ascertain how Missouri's output of zinc compared with other states and the country at large, owing to the manner in which government and other publications report upon zinc. The custom has been to report zinc only in its refined state under the head of "Spelter," the effect of which has been to give credit for the zinc product to the state in which the smelter is located rather than to give credit to the state producing the ore. From which and what follows it will not be dif-

ult to observe wherein Missouri has suffered by comparisons made under the prevailing methods of reporting the zinc product.

Several years since the inspector secured the data from which he constructed a table for his annual report, showing the car load shipments of ore from the Joplin district, to the smelters located in Wisconsin, Illinois, Indiana, Kansas and Missouri and furnished also the name of the smelter to which the shipments were made. Out of a total of 5,460 cars shipped in one year Missouri had but 739 cars shipped to her smelters. It follows that those who are not familiar with the situation can also be easily misled by statements printed in government reports, for example:

Under the head of zinc, the government report for 1897, has a table as follows:

THE PRODUCTION OF SPELTER FOR 1897.

Western and Southern States.....	10,583 tons.
Illinois and Indiana.....	37,786 "
Kansas.....	83,396 "
Missouri.....	18,125 "
Total.....	99,890 "

Here Missouri for the year 1897, is credited with the production of 18,125 tons of spelter, when in fact the zinc ore of the state in that identical year when reduced to a refined state, produced 74,032 tons of spelter. If we turn to our year just closed with its output of 96,842 tons of high grade zinc ore, equal to 333,684,000 pounds and reduce it to spelter by allowing 3,680 pounds of high grade ore to 1000 pounds of spelter, we get 90,675 tons of spelter; then take our output of low grade or silicate amounting to 14,589 tons, and allowing 2.44 tons of silicate to one ton of spelter, and we get 5,975 tons more of spelter, giving in all for our year's production of spelter 96,650 tons. Compare this product with the product of the entire country for 1897 and a better idea of Missouri's standing as a zinc producing state will result.

If, however, mining journals continue to report our state as formerly, and assuming the average to be the same as formally, we will be credited instead of 96,650 tons of spelter, with about 23,660 tons of spelter; which will represent the ore smelted in Missouri, but not the ore produced in this state, as the remaining three-fourths of the entire product goes to swell the output of spelter in Kansas, Illinois, Indiana and Wisconsin.

Following is a summary of the plant, employees, accidents, etc.

There were 1001 shafts operated during the year, with the following machinery in use: 709 boilers, 493 pumps, 37 air compressors, 490 steam hoisters, 447 horse hoisters, 273 crushers, 662 steam jigs, 750 hand jigs, 202 concentrating plants and 445 hand jig plants.

The employees in and about the mines numbered 6002 miners, 3617 other help including the men employed in the mills of Southeast Missouri, and 1378 men prospecting, making a total of 10,997 men.

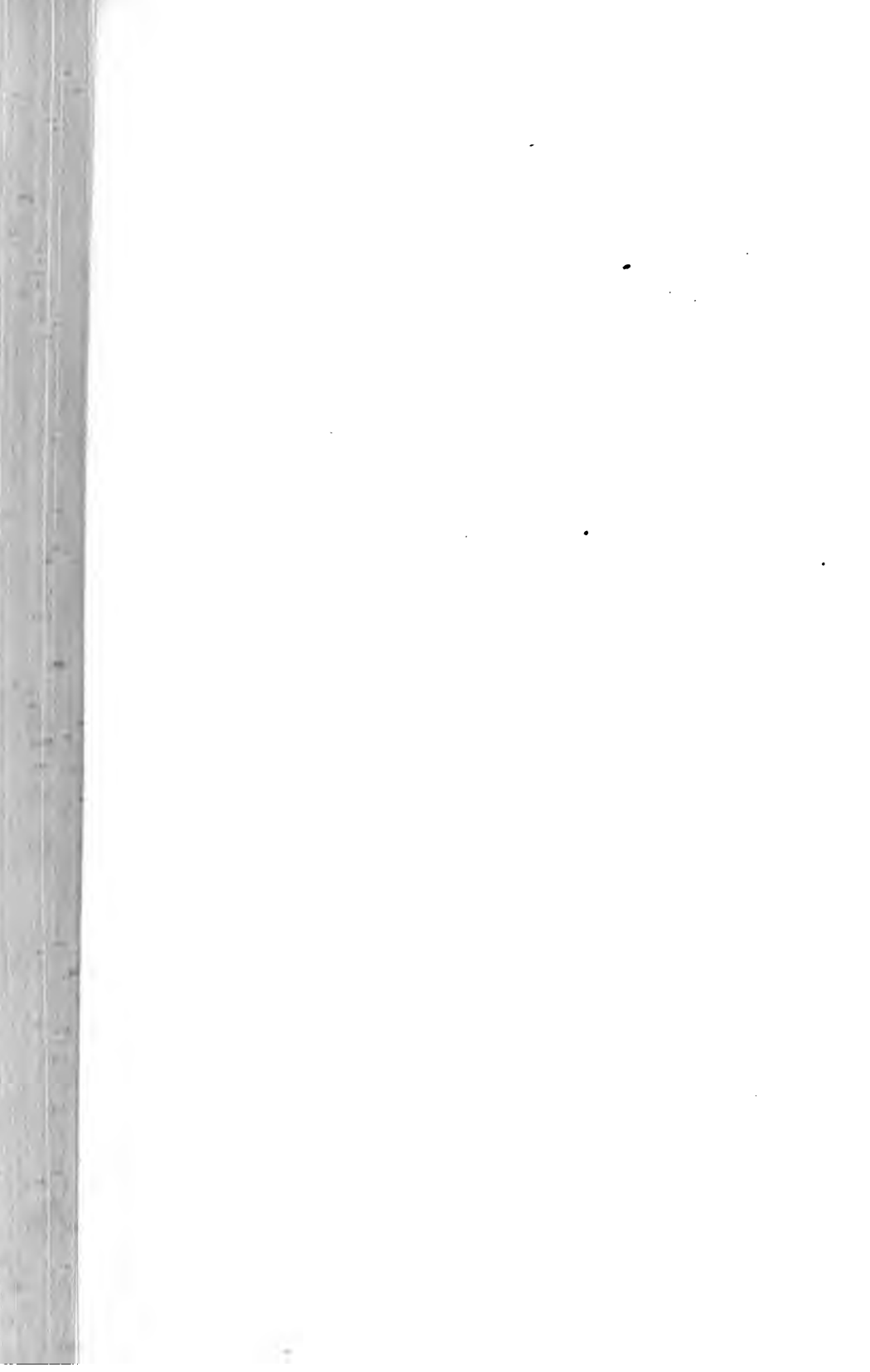
It should be remembered that the number of men given above did not average anything like 300 days during the year. In lead and zinc mines there are many interruptions; then again, while there are many producing shafts, there are also many non-producing shafts in which labor is employed and where the number of tons of clean ore actually mined is reckoned in connection with the total number of men employed, the result is misleading. The inspector for lack of funds and assistants has to rely upon the operators for information concerning the number of employes; many of whom not only operate shafts but sub-lease to small operators, these invariably fail to keep a correct record of the time worked or the number of men employed. If we could secure legislation which would enable us to arrive at the actual number of men employed and time worked, as readily as the number of tons of ore mined is arrived at, then we could get at the facts.

During the year there was a total of 46 accidents, of which 27 were fatal and 19 were non-fatal. With a greater number of men employed and largely increased production; yet for the year the average was one life lost for each 9,343 tons of clean ore mined against 7,357 tons per life lost for the year before. Out of the total number of accidents 47 per cent of them were due directly to the carelessness of the injured persons, while there is an added 13 per cent chargeable to the negligence of fellow workmen, showing that 60 per cent of the accidents were preventable.

Showings of 1654 Drill Holes drilled by L. P. Crossman & Bros. in the Joplin and Webb City districts extending over a period of nearly thirty years.

SURFACE.

0 holes 50 feet deep.	Drill Hole	3 per cent found ore.
0 holes 100 feet deep.		8 per cent found ore.
0 holes 150 feet deep.		25 per cent found ore.
5 holes 250 feet deep.		34 per cent found ore.
0 holes 300 feet deep.		No ore.
5 holes 400 feet deep.		No ore.
2 holes 500 feet deep.		75 per cent found 40 to 60 feet of ore.
8 holes 600 feet deep.		50 per cent found 40 to 60 feet of ore.
8 holes 700 feet deep.		No ore.
7 holes 800 feet deep.		No ore.
6 holes 900 feet deep.		50 per cent found ore.
9 holes 1,000 feet deep.		No ore.
2 holes 1,100 feet deep.		50 per cent found zinc 1,075 to 1,100 feet.
2 holes 1,200 feet deep.		No ore.
2 holes 1,400 feet deep.		No ore.
	Drill Hole	



ACCIDENTS.

The number of accidents occurring during our fiscal year just closed, when measured by the total production of mineral, shows a smaller percentage than last year's record, although the actual number of accidents is greater this year by one accident than last year. For the year there is a total of 46 accidents as against 45 last year; but there was an increased production of 18 per cent and a larger number of men employed this year. As a further showing of a decrease in fatalities, there was mined this year 9,343 tons of ore to each life lost, while last year but 7,357 tons were mined per life lost.

Accidents attributable to the following causes with the percentage of same to total number of accidents is as follows:

From men falling from high places in the mines, $2\frac{1}{2}$ per cent.

From men being exposed to foul air in the mines, $2\frac{1}{2}$ per cent.

From thawing dynamite, $2\frac{1}{2}$ per cent.

From being caught by or falling off of cages while in motion, $2\frac{1}{2}$ per cent.

From material falling down shaft and striking employes, $6\frac{1}{2}$ per cent.

From going back too soon on shots, $6\frac{1}{2}$ per cent.

From tamping shots with metal bars, 8 1-3 per cent.

From premature blasts, 10 2-3 per cent.

From falling down shaft, 13 per cent.

From being caught by or from faulty machinery, 15 per cent.

From falls of rock and roof, 30 per cent.

No argument is needed in explanation of many of the above accidents, especially with those acquainted with mining methods. The single mention of some of the causes is sufficient to indicate carelessness. For instance, "tamping shots with metal bars," this character of accident invariably originates with the miner himself; premature blasts, material falling down shaft and going back too soon on shots are all in evidence of carelessness somewhere. Tamping shots with metal bar is universally condemned by mining men as an extra hazardous undertaking, and no sane operator would permit it; yet miners in their haste and indifference to consequences and with the many sad experiences of the past fresh in their minds, still persist in the employment of such deadly aids, when a little precaution would prevent accidents of this nature.

Careful investigation as to the nature and result of the accidents occurring during the year, develops the astonishing fact that 47 per cent of all the accidents was due directly to the carelessness of the injured persons, while an additional 13 per cent is chargeable to the carelessness of fellow workmen, making the extraordinary total of 60 per cent of preventable accidents during the year.

We are glad to note increased attention given to the question of insurance on the part of our miners; but there is much room for improvement as may be noted in the fact that out of 46 accidents there was a total of \$7,700 insurance and out of which among the fatally injured but \$2,500 was left for the support of 15 widows and 41 children.

The necessity for coroner's inquests and investigations must be apparent to all fair minded persons, and yet there are counties reaping a rich harvest from their mineral resources and developments, that will not permit the expense attending an inquest. There are many fatal accidents the nature of which makes unnecessary an inquest, but where such investigation is necessary the inspector should have the benefit of such help, to say nothing of the demands of justice.

FATAL ACCIDENTS.

JASPER COUNTY.

Chas. Mahan.

August 1, 1898, Chas. Mahan was killed by falling down a shaft on the property of the Bunker Hill Mining Co. The deceased was not an employee. He left his job at the hotel with the intention of seeking employment in the mines and reached the shaft just as the night shift was going into the ground. He started to go to the top of the shaft to see the men go down, and in going rather hurriedly caught his foot on a cable, stumbled and fell down the shaft, about 135 feet deep. Death ensued in about three and one-half hours. Coroner's inquest; verdict, accidental death and no responsibility attached to the mining company. The deceased came to Webb City a tramp, was supposed to be from Pennsylvania, rumor said Pittsburg, but inquiry made with the chief of police failed to identify him. No trace of his residence or family could be had.

Fredrick J. Badgley.

August 15, 1898, Fredrick J. Badgley, aged 19 years and 8 months, was instantly killed while working in a mine on the McConey land

about two miles east of Joplin. The young man had been working at the shaft with his father, James Badgley, for about two weeks, and on the morning of the above date, he went into the shaft and fired a shot, after which his father let him down to bail the water out. One barrel had been taken out and the second one was about two-thirds of the way up when the barrel became unhooked from the rope and dropped to the bottom of the shaft, striking young Badgley on the head, crushing and killing him instantly. His father heard the crash and called to him but got no answer. He then went to the Frey mine, near by, and got assistance of two men, one of whom went into the shaft and got the body out. He was carried to his home about fifty yards away from the mine, where Coroner Whitely held an inquest the same evening. An examination showed that the unfortunate man's head was smashed in, and his neck broken by the crushing weight of the barrel of water. The only witnesses examined by the coroner were the boy's father and George Lake, who helped to take the body out of the shaft. The opinion of both was that the barrel was not properly hooked on to the rope, there being so much smoke in the shaft from the shot that had just been fired, that Badgley could not see that the hook was out of place. The coroner's verdict was in accordance with the above facts.

Death of Charles Schulte.

August 22, 1898. This accident was one of the most terrible in the history of mining in the southwest district. Schulte lived in Joplin and was engaged in mining at the Nap Perry Mine in Lone Elm. He was engaged on the night shift and had been drilling a hole on a stope which was slanting. A spoon was leaning against the stope and as the unfortunate man started to slide down to the next stope, the underside of his left thigh came in contact with the spoon. It entered his body at that point, punctured the intestines and extended up into his stomach a distance of fourteen inches, which was plainly marked by the blood on the steel instrument. It required the united effort of two men to remove it from his body. He was taken to his home where Dr. Snyder was called to attend him, and he was made as comfortable as the circumstances would admit, when death came to his relief a few hours later. The deceased was in the prime of life, being only twenty-four years of age.

Coroner Whiteley rendered a verdict in accordance with the above facts.

Death of Robert Ebensteen.

About eleven o'clock on the morning of the 22d of August, 1898, the deceased, who was sinking a shaft on contract for Norsworthy, Kelso & Company, which is situated east of Joplin and just east of the Rex land, and on a forty acre lease owned by the above company, met with an accidental death, caused by a premature explosion of three sticks of powder with which a drill hole was being charged. To give a full and clear account of this accident, I shall cite the reader to the following: This unfortunate miner appeared at the shaft on the morning of the 22d of August, 1898, in company with Jake Miller, his brother-in-law, who was assisting him temporarily in the work. In addition to these two men, Ed. Norsworthy, a fifteen year old boy, was running the hoister, the three carrying on the work. On this fatal morning, Ebensteen and Miller, his brother-in-law, descended to the bottom of the shaft, which was about fifty-five feet in depth, where they drilled one hole, which they shot with a battery. The deceased descended alone next time, taking with him three sticks of powder with which to charge the drill hole in the corner of the shaft. This was the last seen of Ebensteen by his comrades, when in life, though he sent out several barrels of water, and the parties on top could distinctly hear him at work in the sump, pounding away with a hammer. When the last barrel of water was about half way up the shaft, the hoister boy heard the explosion, and fell back quickly to escape the flying rocks. This presence of mind, no doubt saved his life, as flying rocks riddled the water barrel and nearly demolished the roof of the derrick. Miller ran to the shaft, fully realizing that his brother-in-law had been killed, and pulled up the rope from which the water barrel had been hung. Hooking on an extra tub he descended and found Ebensteen in the bottom of the shaft dead, the right side of his face being completely torn off. With difficulty, he loaded the deceased into the tub, standing in water up to his waist while performing this disagreeable duty. The cause of the explosion can not be definitely determined, but pounding was heard by both Miller and the Norsworthy boy, very distinctly just before the explosion occurred, and it is very evident that an accident from causes set forth above, where the giant powder is tamped with a metal bar, may occur at any time.

The body was removed to the undertakers' room at Joplin where Coroner Whitely deemed it inadvisable to hold an inquest by jury, and returned a verdict as follows:

I, W. M. Whitely, coroner of Jasper county, find that Bob Ebensteen came to his death from a dynamite explosion while he was loading a drilled hole.

Death of T. P. Wood and Henry Haines.

T. P. Wood met instant death while at work in the Harlan & Moody mine on the Center Creek Company's land near Webb City, at about two o'clock on the morning of the 10th of September, 1898. Deceased and Henry Haines were working in the above mine on the night shift.

A scaffold had been built about thirty-five feet and near the top of the drift to enable the workmen to shoot boulders from the roof. They neglected to clean the shot or cut away the loose rock, however, and at the time above stated, while these unfortunate men were popping boulders beneath, a mass of boulders gave way and instantly killed Wood and broke both legs and one arm of Haines and otherwise injured him so that he died the following morning, September 11th. Haines was the night foreman.

The evidence at the coroner's inquest showed conclusively that the accident was caused by neglecting to clean the shot which had been fired in the roof.

The coroner rendered the following verdict:

I, W. M. Whiteley, coroner of Jasper county, find that T. P. Wood came to his death in the Harlan & Moody mine from rocks falling from the roof, from an overhead shot while deceased and Henry Haines were popping boulders forty feet below, without first ascending and scaling the roof after the last shot had been fired by the day shift.

No inquest was held on the body of Haines as the coroner's report to the county officials in the Woods case, was thought sufficient.

Wood resided in Carterville, while Haines was a resident of Webb City, Mo.

W. P. Craig.

October 22, 1898, W. P. Craig met with a fatal accident while at work in the P. E. mine. It is claimed that a rock about the size of a hen egg struck the deceased on the head while standing in the bottom of the shaft, fracturing the back part of the skull from the effects of which he died six days later. He was 23 years of age and married; was insured for six months' pay at the rate of \$2 per day.

No inquest.

John Martin.

November 3, 1898, John Martin, a miner employed by Thayer & Chandler on the land of the Chicago Consolidated Mining Co., was killed instantly by a fall of roof. The deceased was working under

dangerous roof and it is claimed was warned by the superintendent just before going down to trim the roof, and shoot down that very portion of it that afterwards fell. He appears to have ignored the order and shot other holes on the stope left by the day force. The result was that about two tons of rock fell from the roof, killing him, and O. Woodard also.

O. Woodard.

November 3, 1898, O. Woodard was killed as above described.

James Bryant and Abner Brinkley.

November 9, 1898, James Bryant and Abner Brinkley, miners in the employ of the Gaddis Mining Co., met with what proved for each of them a fatal accident, and slight injuries to three others.. The accident was due to the premature explosion of a blast. Mr. Bradley was loading the shot, it appears, when the explosion took place and it will likely never be known what was the true cause. The use of metal for tamping bars is altogether too common a practice and it may be that this is further evidence of the recklessness of such proceeding.

Accidental Death of Bert Hann.

November 15, 1898, Bert Hann was accidentally and instantly killed at the C. C. Hume mine located on the Eleventh Hour ground about two and one-half miles southeast of Webb City. The accident was caused by Bert Curtis, the engineer and drill carrier, letting a drill accidentally fall into the shaft. It appears that Curtis had sharpened some drills and carried them to or near the shaft for the purpose of lowering them to the men below when one of the drills slipped out of his hand into the shaft, striking the deceased, who happened to be standing in the shaft 160 feet below, on the head, causing instant death. The coroner's jury in this case, returned a verdict of accidental death in accordance with the above report. If greater care was exercised around mines, such accidents as this would not occur. There was a degree of carelessness surrounding this accident, in the opinion of the inspector, which is difficult to excuse.

J. L. Cullenden.

December 2, 1898, J. L. Cullenden, a miner employed at the mine of Ferd Herold, while engaged in sinking a shaft was instantly killed. Mr. C. E. McCoy, the hoisterman and under whom the deceased was at work, claims that a boulder from the side of the shaft fell and caused the accident. The superintendent expresses the opinion that the accident was due to the carelessness of C. E. McCoy's hoisting.

The coroner's verdict was, "Came to his death by a boulder falling from the side of the shaft, striking him on the head, killing him."

The deceased was 45 years of age, married and the father of five children.

Death of Chas. Davis.

February 15, 1899, Chas. Davis met instant death at the Tennessee Mine on the Lone Lady lease at Central City, Jasper county. The deceased, with John Sullivan and Gilbert Mott, was engaged in shooting down a pillow, the roof of the drift being considered safe at the time, having been examined a short time before the accident occurred. After one shot had been fired, these unfortunate men went back to put in another shot, when without sufficient warning for the men to make their escape, tons of earth fell, completely covering Davis and seriously injuring Sullivan and Mott. The latter two were wedged in against the sides of the drift and were rescued with great difficulty. It required two hours for the rescuing party to remove the tons of earth which fell upon Davis, and when extricated, his head and body were crushed in a horrible manner. Deputy Coroner W. R. Fletcher, of Joplin, was notified and immediately went to the scene of the accident and after taking the testimony of a number of witnesses and investigating fully, the cause of the accident, decided that the accident was unavoidable, and refrained from impaneling a jury.

In the above accident, Sullivan's injuries consisted of one leg being broken at the ankle and the other at the thigh. Mott had one leg broken and received severe bruises about the body.

Sullivan had the following, in substance, to say about the accident: He went to cut a log out of the way of the spade hands about five minutes before the accident happened, and had not removed the timber when the roof began to crack. He dropped the ax and jumped toward the pen when the roof fell and struck him, pinning him against the pen and almost completely covering him up. He said he did not consider the ground in a dangerous condition, in the shape it was, and the accident in his opinion was unavoidable and no one to blame.

Accidental Death of L. S. Allison.

The accidental and instant death of Mr. L. S. Allison, of Hazleton, Pa., principal owner of the Oakdale Mines located about one mile south of Alba, which happened on February 28, 1899, was another

accident deeply deplored by the people generally in the mining district of southwest Missouri. Mr. Allison was one of the progressive and energetic eastern gentlemen who had faith in, and had invested largely in the mineral properties of Jasper county. The shaft in which the deceased met his death was about 180 feet in depth and known as the Oakdale Mining Shaft. The ground foreman and deceased were being hoisted out of the shaft, when about five feet from the bottom, a piece of timber about three inches in diameter and eight inches in length which had evidently been loosened by freezing and thawing, fell from about 160 feet above, striking the unfortunate man on the head, killing him instantly. The coroner's jury returned a verdict of accidental death in accordance with the above reported facts.

Fatal Accident of T. E. Kier.

March 25, 1899. The death of Mr. T. E. Kier is another to be deplored and attributable to the fatal boulder. The deceased met instant death in his own mine on the Perry Lease near Joplin, by a falling boulder without a moment's warning. Mr. Kier and Mr. Cox, his partner, had operated the shaft all winter and after much hard labor and the expending of considerable money, had brought the property to a weekly producer, the turn-in the day on which the accident occurred, being the fourth since ore was struck. While at work on the fatal day in the face of the drift, deceased noticed a large boulder which he considered dangerous and so informed his partner, but it was finally determined to allow it to remain until the following Monday as they did not intend to do very much work in the drift until that time.. After making their weekly turn-in, Mr. Cox left the ground to get their check cashed which they had received in payment for their ore. It would appear that Mr. Kier changed his mind as he and an employe went to work putting in the shot to remove the boulder, when without warning the huge rock rolled from the face, killing him instantly. The employe ran to the shaft and gave the alarm when assistance was promptly rendered by near-by miners, but the unfortunate man was dead. The deceased was horribly mangled, his neck and both legs being broken, his skull crushed, besides being bruised all over the body, proving beyond doubt that death was almost instantaneous. Mr. Kier was a cripple, having lost a part of one leg some years ago while serving as railroad conductor. Deputy Coroner Fletcher held an inquest the day following and returned a verdict in accordance with the above report.

Accidental Death of John Smith.

August 3, 1899, John Smith met almost instant death in a mine on the Missouri Lead & Zinc Company's land about one mile southeast of Joplin. Deceased was working in a shaft where a horse hoister was being used and was being hoisted out of the shaft when the spool flew out of gear, allowing the tub to run back. The hoisterman threw it in gear and it is thought that the sudden stop caused Smith to lose his hold and fall to the bottom of the shaft which was about eighty-five feet deep. The hoisterman summoned immediate help, when the unfortunate man was brought to the surface. His injuries consisted of a deep cut in the head besides internal and other injuries. Medical aid was quickly summoned but he never regained consciousness and died about an hour later. Deputy Coroner Flethcher's verdict was in accordance with above report.

Accidental Death of Dan Carmine.

April 4, 1899, Dan Carmine received injuries at the "Old Shoe" mine on the Perry, Lone Elm Lease near Joplin, from which he died three hours later. Deceased was going down the shaft to repair the pump, but instead of getting into the tub, he fixed a sling by tying the ends of a small rope and attaching it to the cable hook, presumably for his support while doing the work of repairing. He had descended about thirty feet at a slow speed when he fell off the cable without apparent cause and was hurled to a frightful death ninety feet below. The sling made for his support was out of one half-inch rope and evidently came untied while he was being lowered into the shaft. In the fall, both legs and one arm were broken besides receiving other injuries. He was immediately hoisted to the surface and taken to his home where every care was given him, but to no avail. Deceased arranged the sling for his descent into the shaft himself and was certainly very careless in its preparation. An inquest was held by Deputy Coroner Fletcher who returned a verdict in accordance with above.

Accidental Death of Ernest Tyler.

April 27, 1899, Ernest Tyler met instant death in a mine owned by Smith & Holcomb, near Webb City, on the Certer Creek Mining Co.'s land. There seems to be some doubt as to the exact cause of this accident. Tyler is reported to have been drilling a hole and had the shot ready to fire. Being uncertain as to the cause of the accident, two theories are advanced. One is, he lit the fuse, started for the tub and gave the signal to hoist, but the tub may have been detached and

deceased killed by the explosion. The other, and the most feasible theory is, that after lighting the fuse and seeing the tub detached, he grasped the rope and started up. As it was a horse hoister and the shaft 150 feet in depth, it is supposed his hold gave way and he fell to the bottom of the shaft, killing him instantly. Mr. Holcomb, one of the mine owners who happened to be near when the accident occurred, went down and brought the unfortunate man to the surface when it was found his back was broken and other injuries sustained. Deceased was taken at once to the undertaker's establishment, where Coroner Whitely held an inquest and returned a verdict of accidental death by falling down a shaft.

Accidental Death of V. M. Ingerham.

May 5, 1899, V. M. Ingerham met instant death at the Osceola Mining Company's mine situated about one mile south of Carterville. This accident was caused solely, it would appear, from the use of defective fuse and no one to blame for the unfortunate occurrence, except it be the manufacturers of the fuse. The deceased and a number of workmen in the various drifts of the mine prepared a number of shots at the same time and lit the fuse. The reports were counted by the men as each explosion occurred and it appears that the number of reports counted agreed with the number of shots prepared and the men returned to their respective drifts to work, and just as Ingerham entered the drift in which he had been working, the shot exploded, killing him instantly. His neck was found to be broken besides receiving other injuries. The theory of a defective fuse causing this accident was so strongly developed at the inquest which Coroner Whitely held, that I give his verdict in full as follows:

"I, the coroner of Jasper county, as well as the sworn witness, find that deceased, V. M. Ingerham, came to his death at the Osceola mine from a delayed explosion. Explosion of a blast which was put in by himself and helper. Said delayed explosion was caused by a defective fuse and that no one was to blame except it may be the defective workmanship of the fuse, which fact is impossible for your coroner to determine, and I therefore advise all mine operators to get the most reliable brand of fuse, as well as to demand of the factories a reliable article made on careful scientific principles."

J. Packard.

May 13, 1899, J. Packard, foreman for the Willow Mining Company, was fatally injured by machinery. The deceased in passing through the mill saw a rock about to pass through that was too large,

Joseph Sherlock.

April 24, 1899, the Desloge Consolidated Lead Co. had another fatal accident. Joseph Sherlock, a miner was killed by a fall of roof. It appears that the deceased and his foreman were together at the time of the accident and engaged in removing a scale of loose rock on the roof; the roof it is claimed had been sounded just prior to the trouble and all appeared safe except the scale, but in removing the latter a much greater quantity of material fell than was anticipated, a piece of which struck Sherlock with the result mentioned.

Coroner's verdict: Accident while removing rock and engaged in his regular business.

Albert House.

May 27, 1899, Albert House, a miner employed at the Central Lead Co. mine, was killed by a fall of roof. The deceased it seems while at work was struck by a rock which fell from the roof and instantly killed.

Coroner's verdict was : Accidental death.

TABLE VII—Showing Accidents in Lead and Zinc

JASPER

Name of injured person.	With whom employed.	Occupation of injured person.	Date of accident.	Age.....	Single.....	Married.....	No. of children.....	Non-fatal.....	Fatal.....
F. L. Badgley.....	Badgley & McAfee.....	Miner.....	Aug. 15, '98..	19	1	..	..	..	1
G. R. Elinstine.....	Norsworthy, Kelso & Co..	"	22, '98..	35	..	1	3	..	1
O. Scholtey.....	E. N. Perry.....	"	22, '98..	25	1	..	..	..	1
Stephen Offield.....	S. F. Clark.....	"	Sept. 9, '98..	32	..	1	..	1	..
Henry Haines.....	Harlem & Moody.....	"	10, '98..	38	1	..	..	..	1
T. P. Wood.....	Harlem & Moody.....	"	10, '98..	38	..	1	2	..	1
John Gohean.....	Laura, S. Mining Co.....	"	30, '98..	30	1	..	..	1	..
W. P. Craig.....	P. E. Mine.....	"	Oct. 22, '98..	23	..	1	..	..	1
John Martin.....	Thayer & Chandler.....	"	Nov. 3, '98..	35	1	..	..	..	1
O. Woodward.....	Thayer & Chandler.....	"	3, '98..	32	..	1	..	..	1
E. P. Jenkins.....	Davey & Son.....	"	19, '98..	27	1	..	..	1	..
Chas. Morris.....	Gaddis Mining Co.....	"	9, '98..	30	1	..	..	1	..
Abner Brinkley.....	Gaddis Mining Co.....	"	9, '98..	20	1	..	..	1	..
Jas. Bryant.....	"	"	9, '98..	45	..	1	6	..	1
Bert Hann.....	C. C. Hume.....	"	15, '98..	29	..	1	1	..	1
F. L. Cellenden.....	Ferd Herold.....	"	Dec. 2, '98..	45	..	1	5	..	1
Geo. McKee.....	Aurora Mining Co.....	"	Feb. 6, '99..	42	..	1	..	1	..
H. Black	"	"	6, '99..	33	..	1	..	1	..
I. H. Sullivan.....	Tennessee Mining Co.....	"	18, '99..	24	1	..	..	1	..
Adelbert Mott.....	"	"	18, '99..	22	1	..	..	1	..
Chas. Davis.....	"	"	18, '99..	22	1	..	..	..	1
L. L. Allison.....	Oakdale Mining Co.....	Manager	28, '99..	44	..	1	3	..	1
S. E. Chambers.....	Hawkeye Mining Co.....	Miner.....	Mch. 20, '99..	48	..	1	..	1	..
Jas. Bane.....	Ground & Irwin.....	"	24, '99..	25	1	..	..	1	..
Thos. Kler.....	Cox & Co.....	"	25, '99..	52	..	1	4	..	1
John Smith.....	Missouri Lead & Zinc Co..	"	Apr. 3, '99..	43	..	1	3	..	1
Dan'l Carmine.....	E. N. Perry.....	"	3, '99..	35	..	1	1	..	1
Frank Simmons.....	Dumbauld & Co.....	"	27, '99..	23	..	1	..	1	..
Earnest Tyler.....	Smith & Holcomb.....	"	27, '99..	39	..	1	1	..	1
V. M. Ingerham.....	Osceola Mining Co.....	"	May 5, '99..	25	..	1	1	..	1
A. Patterson.....	Black Eagle Mining Co..	"	17, '99..	35	..	1	..	1	..
E. Hood.....	Little Circle Mining Co..	"	9, '99..	42	..	1	..	1	..
John Michaels.....	Terripen Mining Co.....	"	18, '99..	25	1	..	..	..	1
J. Packard.....	Willow Mining Co.....	Foreman.....	13, '99..	31	..	1	..	..	1
O. D. Ingram.....	Ingram & Co.....	Miner.....	June 9, '99..	21	1	..	..	1	..
Totals.....	.....	.....	.....	14	21	30	14	21	

Mines, by Counties, for the Year Ending June 30, 1899.

COUNTY.

Insured.		Nature of accident.	Coroner's verdict.
Yes.....	No..... Amount of insurance.		
1		Failure to properly adjust hook on hoisting rope, barrel falling down shaft.....	Accident.
1		Premature blast, supposed to have tamped with metal bar.....	Premature discharge of shot.
1		Fell from slope on an iron rod.....	No inquest.
1		Fall of rock, foot crushed and amputated.....	
1		Fall of rock.....	No inquest.
1		Fall of rock.....	No inquest.
1	\$2,000	Premature explosion of shot, both eyes destroyed.....	
1	\$1 per day 1 year	Fall of rock.....	No inquest.
1		Fall of roof.....	No inquest.
1		Fall of roof.....	No inquest.
1		Holsterman let machinery get the start of him, leg broken.....	
1	Half pay	Premature blast.....	No inquest.
1	Half pay	Premature blast.....	
1		Caused by drill falling out of the hands of an employe.....	Accident.
1		Supposed to be due to careless hoisting.....	Came to his death by boulder falling from side of shaft.
1	Per cent of wages.	Premature explosion of shot due to use of metal tamping-bar.....	
1	Per cent of wages.	Premature explosion of shot due to use of metal tamping-bar.....	
1		Fall of roof.....	
1		".....	Unavoidable accident.
1		Fall of material down shaft caused by freezing and thawing.....	Accidental.
1		Premature explosion of shot.....	
1		Went back too soon on shot; lost an eye.....	
1	26 weeks' wages.	Fall of rock.....	Accident.
1		Machinery out of order; spool flew out of gear.....	Accident caused by holster slipping out of gear.
1		Fell down shaft while being lowered on the cable; real cause unknown.....	No inquest.
1		Tamping shot with metal bar; exploded shot; lost his eyes.....	
1		Fell from cable in being hoisted.....	Broken neck by falling in shaft.
1		Went back too soon on shot.....	Defective fuse.
1		Started to go down shaft by sliding on the rope; failed to throw the holster in gear.....	
1	One-half wages.	Went back on shot too soon.....	Accidental.
1		Foul air in shaft.....	No inquest.
1	\$2,000	Caught by machinery.....	
1		Faulty hook on hoisting rope, causing him to fall.....	

REPORT OF THE

SHOWING ACCIDENTS IN LEA

FRANKL

employed.	Occupation of injured person.	Date of accident.	Age	No. of children	Married	Single	Non-Fatal
Gas Real Estate Co.....	Superintendent..	Jan. 9, '99..	36	1	1	1	1

LAWREN

J. B. Davis Mine.....	Miner.....	Aug. 1, '98..	28	1	1	1	1
J. B. Davis Mine.....	".....	Oct. 3, '98..	48	1	1	1	1
W. F. Richardson.....	Superintendent..	May 9, '98..	27	1	1	1	1
			2	1	1	1	1

NEWT

J. S. Coxey.....	Miner.....	June 20, '99..	54	1	7	1	1
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ST. FRANCO

Desloge Mining Co.....	Miner.....	Oct. 7, '98..	1	1	1	1	1
St. Joseph Lead Co.....	".....	Jan. 3, '99..	27	1	1	1	1
".....	".....	Jan. 27, '99..	40	1	4	1	1
Doe Run Lead Co.....	".....	Feb. 23, '99..	23	1	1	1	1
Desloge Lead Co.....	".....	Apr. 24, '99..	30	1	1	1	1
Central Lead Co.....	".....	May 27, '99..	28	1	1	1	1
Totals.....			5	1	4	2	2

D ZINC MINES—Continued.

UNTY.

Insured.	Nature of accident.	Coroner's verdict.
Amount of insurance.		
1.....	Thawing dynamite.....	

UNTY.

One-half wages... \$1,000	Fall of roof..... Caught by machinery.....	No inquest.
1		
1		

UNTY.

1.....	Fell in shaft—faulty machinery...	Justice opinion, no inquest necessary.
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UNTY.

	Fell off cage into shaft—supposed to have had an unconscious spell.....	Cause unknown.
1.....	Fell in shaft from a platform.....	
1.....	Hog fell down shaft, striking deceased.....	Accidental
1.....	Caught by cage.....	
1.....	Fall of roof.....	Accidental death.
1.....	Fall of roof.....	Accidental death.
6		

CAUSE OF ACCIDENT AND NUMBER INJURED FROM EACH CAUSE.

Table VIII.

Nature of accident.	Fatal.	Non-fatal.	Total.
Falling down shaft.....	3	2	5
Falling from high places in mine.....	1		1
Fall of platform and scaffold.....		1	1
Fall of material into shaft.....	3		3
Fall of rock and roof mine.....	12	3	15
Machinery caught in.....	2	2	4
Machinery at fault.....	1	2	3
Premature explosion of blast.....	4	8	12
Suffocated by foul air or gas.....	1		1
Thawing dynamite.....		1	1
Totals.....	27	19	46

Table IX.

Classification.	No.
Non-fatal accidents.....	15
Fatal accidents.....	31
Total.....	46
Single men injured.....	25
Married men injured.....	21
Total.....	46
Wives made widows.....	15
Children made fatherless.....	31

SOUTHWEST MISSOURI—JOPLIN DISTRICT.

MISSOURI LEAD & ZINC CO.

The Missouri Lead & Zinc Co. is composed of a syndicate of bankers with extensive capital, who own 1,200 acres of land in fee simple situated in the southeastern portion of the city of Joplin.. The company is capitalized for \$300,000 with Alexander Ross as its president, Wm. F. Reed, secretary and treasurer, and H. R. Conklin, of Joplin, Mo., superintendent. This company leases land to miners, and also operates shafts and mills extensively. Of the fourteen shafts operated by the company, ten are producing ore and four are developing ore which will almost pay for concentrating and which were located by drilling. The company has two prospect drills which are kept running regularly on its land. A large mill, having four separate and complete concentrating mills in one, has just been erected to replace the former mill which was burned on June 15th, 1899. This mill is by far the largest in the southwestern district, is of the very latest design, and will handle about 1,200 tons of dirt every twenty-four hours. The mill is driven by electric motors operated from a power house located a short distance away. The power plant consists of 400 horse power of boilers and 250 horse power of engines and dynamos, situated on the company's side track for convenience of handling fuel. The company operates steam hoisters at all its shafts and the ore is hauled to the mill in small cars pulled by mules over a narrow gauge track and then hoisted by double cage hoister to the platform in the mill. They also operate one double twelve-inch lift pump, three large Worthington pumps, with five discharges, four small Worthington's with three-inch discharges, six Cook steam pumps and one double eight-inch lift pump, and with power house, pumps, etc., operate eighteen boilers and drain about 800 acres of its land. The leasees on this land, operate three concentrating mills, twenty-two hand jig plants, forty-nine horse hoisters, five steam hoisters and seven pumps. Of the sixty-eight leasees on the land, thirty-one are producing ore. It has only been of late that the company has leased land to prospectors and the coming year will doubtless show it to be one of the most productive tracts in the district. We mention below some of the larger producers.

Walker & Company.

This company operates two chat mills on the Missouri Lead & Zinc Company's land and are producing from old dumps about 45,000

pounds of zinc ore per week besides about 2,000 pounds of lead ore. The plant is supplied with the necessary boiler and engine power, each with a centrifugal pump, one crusher, two sets of rolls, elevators, screens, and steam jigs. The company gives employment to about twenty-five men.

Postle Mining Company.

This property belongs to O. H. Postle who controls three lots of the Missouri Lead & Zinc Company's land at a royalty of twenty per cent on zinc and twenty-five per cent on lead ore; has four shafts down to the depth of eighty feet but is working at about forty feet below the surface in medium ground which requires very little timbering for its support. The drifts are cut about eight by ten feet on dirt running a very good percentage of zinc ore. The mine is new and just being opened up. A new and complete concentrating mill has been erected supplied with one fifty horse power boiler, a forty horse power engine, one twelve-inch crusher, one set of twenty-four-inch rolls, a four cell rougher and five cell cleaner, steam jigs, screen, etc. Horse hoisters are used for hoisting the dirt while it is hauled with teams to the company's mill for cleaning.

T. L. Brown & Company.

T. L. Brown & Company are operating six lots of the Missouri Lead & Zinc Company's land at a royalty of twenty and twenty-five per cent. They have three shafts down ranging in depth from eighty to one hundred feet and are cutting on dirt which will run about four per cent zinc ore which is hauled to the company's mill for cleaning. Two steam hoisters are used for hoisting the dirt and a production of 10,000 pounds of lead and five tons of zinc ore per week. The ground is not hard but has a good roof. Machinery and other material have been ordered for the erection of a new plant. The mine is under the management of Chas. Brewster of Joplin, Mo.

W. H. N. Francis & Company.

This company is composed of Boston, Mass., gentlemen who operate four lots of the Missouri Lead & Zinc Company's land at twenty and twenty-five per cent royalty. The dirt is hoisted with steam hoister and hauled to the company's plant where it is cleaned ready for the market at sixty cents per ton. Their shaft is 130 feet in depth, in medium soft ground with hard walls. With ten men employed, they produce about ten tons of zinc ore per week. Mr. McGee, of Joplin, Mo., has the management of the mines.

H. N. Chase.

H. N. Chase, trustee, of Boston, Mass., controls four lots of the Missouri Lead & Zinc Company's land at a royalty of twenty and twenty-five per cent and has one shaft sunk to the dept of eighty feet in which he has developed a large body of zinc ore in medium ground. A steam hoister is used and only four men are employed as the mine is just being opened up. The dirt is hauled to the company's mill where it is reduced ready for the market. The company contemplates the erection of a new concentrating mill in the near future.

Coyle, Burress & Company.

This company is composed of Mat Coyle, Dan. Wenrich, Peter Burress and H. D. Dougherty of Joplin, Mo. The company controls nine lots of the Missouri Lead & Zinc Company's land and pay a royalty of twenty and twenty-five per cent on all minerals mined. They have one shaft sunk to the depth of 130 feet and are mining a large face of zinc and lead ore at the 115 foot level. This is one of the richest mines on the land, having produced as high as 18,000 pounds of lead ore per week besides considerable zinc ore. They clean the ore on hand jigs and hoist the dirt with a steam hoister. There is an eighty horse boiler and two Worthington pumps in use. The mines are managed by Mat Coyle, of Joplin.*

Malang & Maloy.

The members of this company are Frank Malang and T. C. Maloy of Joplin, Mo. They have a lease on ten lots of the Missouri Lead & Zinc Company's land and pay a royalty of twenty per cent. One shaft is down to the depth of 120 feet with a good body of lead and zinc ore developed in open ground which requires timbering for its support. Their improvements consist of a twenty-five horse power boiler, one eight-inch lift pump, steam hoister and four hand jigs. The production at present is only about three tons of zinc and 5,000 pounds of lead ore per week. Frank Malang of Joplin is manager.

C. Longworthy & Company.

This company has control of six lots of the Missouri Lead & Zinc Company's ground and has one shaft to 120 feet in depth, at which level a very fair face of zinc ore has been developed. Their improvements consist of a forty horse power boiler and a thirty horse power engine, one double eight-inch lift pump of the Neosho make, a belt hoister and two hand jigs.

Enlow & Company.

Enlow & Company operate one lot on the Missouri Lead & Zinc Company's land with lead and zinc ore developed at a depth of 120 feet which is said to run twenty per cent mineral. Dirt of this percentage is considered exceedingly rich. They use a horse hoister for hoisting purposes and haul the dirt to the company's mill where it is cleaned ready for the market.

I. Jones.

I. Jones operates one lot on the Missouri Lead & Zinc Company's ground which is known as the old No. 3 pump shaft. He has a fair face of lead and zinc ore developed in medium ground. A horse hoister is used for hoisting purposes and the dirt is hauled to the company's mill for cleaning.

Boss & Willman.

Boss & Willman operate one lot of the Missouri Lead & Zinc Company's land and have developed a twenty foot face of high grade zinc ore at a depth of sixty feet. They use a horse hoister and haul the dirt to the company's mill for cleaning. They pay a royalty of twenty-five per cent, employ six men and produce about six tons per week.

Tomlinson & Company.

This company has one lot of the Missouri Lead & Zinc Company's land and operate a good ore run at a depth of seventy feet. The ground at this place appears full of mineral. The dirt is hoisted with horse hoister and hauled to the company's mill where it is cleaned.

Geo. Hampton & Company.

This company has two lots of the Missouri Lead & Zinc Company's ground with five shafts in which they find the ore from thirty to ninety feet below the surface. They use a horse hoister and haul the dirt to the company's mill for reduction.

Chatman & Company.

Chatman & Company have two lots of the Missouri Lead & Zinc Company's land with three shafts and operate one at the depth of sixty feet, at which level a ten foot face of rich ore has been opened up in hard ground. A horse hoister is used and the dirt is hauled to the company's mill.

Mahood & Company.

This company controls nine lots with two shafts on the Missouri Lead & Zinc Company's land with ore developed in each shaft. They use two horse hoisters and haul dirt to the company's mill for cleaning.

Frank Cline.

Frank Cline controls two and one-half lots of the Missouri Lead & Zinc Company's ground and has one shaft down to depth of seventy feet in a good body of ore. The ground is soft and requires timbering for the support of the drifts. He uses a horse hoister and hauls the dirt to the company's mill.

Mose Lyons & Company.

This company has four lots of the Missouri Lead & Zinc Company's land with one shaft down to the depth of fifty feet at which level they have developed a very fair deposit of lead which is hoisted by horse power.

John T. Richardson.

J. T. Richardson of Joplin, Mo., operates one lot on the Missouri Lead & Zinc Company's land and has his shaft down to the depth of 115 feet, at which level a very fair body of lead and zinc ore has been developed in medium ground. He uses a horse hoister and cleans the ore on hand jigs.

ALDRICH & HAFFNER.

This company is composed of J. E. Aldrich and J. E. Haffner of Joplin, Mo. They have a lease on sixty acres of land at a royalty of fifteen per cent, situated about two miles southeast of Joplin, which is owned in fee simple by Gilbert Barbee, Thos. Conner and J. L. Briggs of Joplin, Mo., and Jas. Campbell of St. Louis, Mo. The company does a mining and general leasing business. A royalty of twenty-five per cent is charged all operators on the land. From forty to fifty shafts have been sunk ranging in depth from sixty to 112 feet and ore has been developed in ten of them, while five are producing and make from twenty to thirty tons of zinc ore per week. The ground is medium and very little timbering is required. This company operates one shaft and drains the ground for the operators. A steam and six-inch lift pump are used for draining the ground. This tract of mineral land presents a busy scene as there are nineteen shafts going down in addition to those in which mineral has been developed. We mention a few of the operators below.

Little Turtle Mining Company.

This company is composed of Watson, Bolen & Company of Joplin, Mo., who operate one lot of the Aldrich & Haffner lease and have one shaft to the depth of fifty-seven feet with an eighteen foot face of rich ore developed. They employ nine men, use a horse hoister and three hand jigs, and produce from twelve to fifteen tons of zinc ore per week.

Armstrong & Company.

Armstrong & Company operate one lot on the Aldrich & Haffner lease and have a good body of zinc ore developed at the depth of fifty-seven feet in open ground. They give employment to nine men, use a horse hoister and clean the ore on three hand jigs.

Friscoe Five.

This company has two lots of the Aldrich & Haffner lease with one shaft down to depth of sixty feet and a fair face of ore developed. A horse hoister is used and the dirt cleaned on hand jigs. The mine is new and only about three tons per week are produced.

Peck, Jarrett & Company.

Geo. Peck, Jas. Jarrett, Pollard & McCurdy, compose this company and have four lots of the Aldrich & Haffner lease. They have sunk seventeen feet in rich zinc ore and are not yet through the body. They have a horse hoister and two hand jigs.

CHITWOOD HOLLOW.

The tract of land generally known as Chitwood Hollow comprises eighty acres formerly belonging to the Chitwood Hollow Mining Land Company and 120 acres formerly known as the Leonard land and is situated about two and one-half miles northwest of Joplin. This property was purchased recently from the Chitwood Hollow Mining & Land Company and the Leonard Mercantile and Realty Company, by the United Zinc and Lead Company of Boston, Mass., one of the eastern companies that have recently invested heavily in the Joplin district. The property has been developed during the past year to such an extent that it is proving to be one of the best tracts of mineral land in the district. On the Chitwood Hollow Mining Land, eighty eight-inch drill holes are reported sunk during the past year, twelve of which penetrated large bodies of zinc ore. On the lease owned by Adam Scott, E. M. Robertson and Bud. M. Robinson, the largest strikes

have been found, in many of them the ore is reported found from fifty to sixty feet in thickness at a depth of from 108 to 155 feet. Every lot on this eighty is under lease and mining being pushed. At the present time there are four mills in operation: The Cock Robin, Chicago Consolidated, Pelican and Conqueror, mention of which follows later. In addition to the properties named, the Silver Shield and King Jack properties belonging to Bud. M. Robinson and associates of Chicago have developed into mines that at present fully warrant the erection of concentrating plants. The drill hole on the Silver Shield entered the ore at the depth of sixty-three feet and continued in ore to 141 feet. Especially fine specimens of solid chunks of Peacock Ore, weighing close to 200 pounds, have been taken from this mine and placed on exhibition at the hotels of Joplin, which are pronounced among the finest in the district. The King Jack had a forty foot face of ore, demonstrated by drilling, to which a shaft has been sunk and the ore opened up sufficiently to warrant the erection of a concentrating plant which has been contracted for. The Lawrence Mining and Milling Company are operating on above land and have two drill holes which penetrate from twenty-five to fifty feet of ore, striking it at about the 100 foot level, on which developments are being pushed. Adam Scott has two leases on Chitwood and is putting down a seven by twelve shaft with the expectation of putting in cages. He had on one of these leases, according to the drill hole, about fifty feet of ore and on the other sixty feet. He has plans drawn for a 250 ton mill and will erect the same as soon as the ore bodies can be developed. The Concord Mining Company, the property of E. M. Robertson and associates, have two drill holes showing from twenty-five to fifty feet of ore and are pushing the work of sinking on same. The Monarch Mining Company has still another lease on this land in which they had from twenty-five to forty feet of ore in three drill holes and are sinking on same. The shafts on this land in which ore is already developed practically assure ten mills including the four already in operation. The ore found in this neighborhood brings the top price, there being no ores sold from the land since the first of last March for less than \$42 per ton.

On the 120 acres mentioned above, there are at present two mills in operation, the Sam Moore and Jumbo, and another, the Monarch, will be ready to begin work by the tenth of October. Besides these three mills, there are two other mines, the Pittsburg and the Brooklyn, on the Leonard land. In the Pittsburg mine they have found considerable ore from 90 to 170 feet. In the Brooklyn, good ore has been taken out from a depth of 75 to 150 feet in sinking. At the 100 foot

level a twenty-five foot face of high grade ore has been developed. The company owning same, are Boston capitalists, and they will erect a mill as soon as water is found in sufficient quantity to operate same. Practically all of the 120 acres is under lease and a number of drill hole strikes have been made thereon, but developments have not progressed sufficiently to demonstrate how valuable it may be. Following are the operators with mills:

Chicago Consolidated.

The Chicago Consolidated is a corporation, the stock of which was owned or controlled by Thayer & Chandler of Chicago until recently purchased by the United Zinc and Lead Company. The property consists of a lease of eight lots from the Chitwood Mining Land Company, together with a concentrating plant thereon. The mine is under the management of W. O. Coates, as is all other interests of Thayer & Chandler in Chitwood. The mill is an old style structure but is capable of handling a large amount of dirt. It is equipped with one 100 horse power boiler, a sixty horse power engine, a sixteen-inch crusher and large rolls, and two steam jigs besides all necessary equipment to economically handle zinc and lead ore. The shaft is about 145 feet in depth and the face of ore being worked on at present is about fifty-five feet in heighth and large quantities of ore are to be seen. The ground is of a hard formation, eleven men being employed in breaking it while six men are employed for top work. The dirt will run between eight and ten per cent ore and has yielded steady and satisfactory.

The Cock Robin.

This property was also one of Thayer & Chandler's but was sold at the same time the Chicago Consolidated was sold to the United Zinc and Lead Company. The property consists of a ten year lease on four lots of the Chitwood ground and adjoins the Chicago Consolidated on the north. The mill on the Cock Robin is of more recent construction and is better equipped for handling ore than the Chicago Consolidated. They have a ten-inch crusher, large rolls, five and six cell Cooley steam jigs with a capacity for handling 125 tons of dirt per shift of ten hours. There are two forty-five horse power boilers, a forty-five horse power Atlas engine and all other equipment necessary to a complete and modern mill. Their shaft is about 145 feet in depth and at present their face of ore is about seventy feet high. The drifts between the Cock Robin and Chicago Consolidated having been cut so as to meet, good ventilation is thereby furnished both mines. The present face of ore lies at right angles to the original drift, and has been so blocked that the company is sure of long and profitable work.

The Pelican Mine.

The "Pelican" mine is another of the properties of Thayer & Chandler, included in the recent sale, and comprises five lots of the Chitwood Hollow property. This lease lies to the southeast of the Chicago Consolidated and directly north of the Conqueror. They had the misfortune this summer of having their mill completely destroyed by fire but it has been rebuilt and will be in operation by the tenth of October. Their new mill has a daily capacity of 125 tons and is supplied with a sixteen-inch crusher, large rolls, two large size Faust steam jigs, a fifty-five horse power Automatic Atlas engine, one 120 horse power boiler with all other necessary equipment for a complete and modern plant. Their shaft here is 155 feet in depth and in the drift they had a face of ore about fifty feet high by sixty wide. Owing to a squeeze at the bottom of the shaft work was abandoned for several months this spring. The company, however, has sunk a new shaft about 100 yards to the north and have just opened out into the ore, having at present about a sixteen foot face running north and south from the shaft. The drill hole showed ore at this point from 97 to 156 feet, stopping in ore. The Pelican has been a large producer and with its new mill and new shaft, it will doubtless again head the list in Chitwood Hollow.

The Conqueror.

This mine is owned by Wm. Houk of Joplin, Mo., John D. Gouge of Lafayette, Ind., and G. W. Houk, of Farmersville, Ohio, and is managed by W. A. Ryno. Their property consists of three leases of four lots each in the southwest corner of the Chitwood Hollow land, there being one shaft on each lease. The deepest shaft is 145 feet and the other two are in course of sinking. The face of ore being worked at present is about thirty-five feet high and is of the usual richness of that territory, the minimum weekly production of the mill being about thirty tons. In nine drill holes, averaging 150 feet in depth, seven of them showed good bodies of ore. The mill has a crusher capacity of 125 tons daily and is supplied with about 200 horse power boiler capacity, a forty horse power engine, a fifteen-inch crusher, large rolls, and the Cooley steam jigs of the latest type, a steam hoister at each of the shafts, one of them being a large double hoister of the Freeman make, screen, elevators and large hoisting tubs, sufficient to hoist from 1,200 to 1,500 pounds each trip. The ore produced here is of a very high grade.

Sam Moore.

The Sam Moore property consists of four leases, which is known as the Leadville Forty of the Leonard land. The property is owned by Mr. Moon of St. Louis. He has a large and complete concentrating plant of from 175 to 200 tons capacity. There are three shafts sunk, two to 110 and the other to the depth of 140 feet, all of them being in good mineral. The productions reach from thirty to forty tons of zinc and from 15,000 to 25,000 pounds of lead ore per week. The mill is considered one of the best in the district and is supplied with a fourteen-inch crusher, two sets of twenty-four-inch rolls, steam jig capacity of twenty cells, one 120 horse power boiler, one large Noye engine, elevators, screen, steam hoister, etc., and in addition, there is in place a large Ingersol air compressor with which power is furnished for running the drills. Their plant and mine is lighted by electricity and every part of the equipment appears to be of the latest improved pattern.

Jumbo.

The Jumbo mine is owned by the Standard Zinc and Lead Company, a New York corporation. It controls five lots of the Leadville ground on which it has five shafts sunk, an up-to-date mill of 100 tons capacity, thoroughly equipped for the most economic handling of ore. This property is practically new and has no record at present but the ore developed in the drifts is such as to warrant the expectation of large returns in the very near future.

Monarch Mine.

This lease consists of five lots of the Chitwood Eighty. The shaft is about 160 feet in depth with ore from 117 feet to the bottom of their shaft in good paying quantities for a mill. One of the sights of the mining camp this summer has been the immense piles of crush rock which is reported to reach sixty per cent ore that they have accumulated in the past six months in opening up their drifts. The owners of this property are Gordon Allen, Jas. Mix, E. O. Bartlett and J. E. Aldrich, all of Joplin, and known as the Standard Zinc and Lead Company. Their mill is a model in a great many respects; derrick is high, the dirt being dumped with a swing dump onto a bar screen in order to get rid of the boulders; from a second platform thus necessary, the dirt is fed into the sixteen-inch crusher, thence to two sets of twenty-four-inch rolls; the jigs are of the Cooley pattern, of them large size and of six cells each; the engine is a heavy

eighty horse power slide valve and the boiler is of a 100 horse power capacity. The equipment is very thorough in every respect and has been very carefully constructed. Large productions are expected from this mine.

COTTONWOOD HOLLOW.

The United Zinc & Lead Company bought forty acres commonly known as the Cottonwood Forty of the Leonard interests with the other land purchased from the Leonards this fall. The company has leased twenty acres of this forty on which are located what is known as the old Syndicate Mines, to a Boston corporation who are putting in large pumps and are re-opening the property.

JOHN JACKSON MINING COMPANY.

This company is incorporated under the laws of New Jersey and capitalized at \$105,000 with H. H. Hamil, president, and C. E. Hart, of Joplin, Mo., as manager. The company controls by lease, fifty-nine acres of mineral land owned in fee simple by the John Jackson estate and is situated about two and one-half miles northwest of Joplin. There are six shafts sunk on the land ranging in depth from 125 to 180 feet, but only two are producing ore, one at the depth of 125 and the other at depth of 151 feet. The ore occurs in hard ground which does not require the use of timbers for the support of the drifts. This land has been for some time one of the foremost producers of the Joplin district and is now producing nearly 100 tons per week of zinc ore on which a royalty is paid of ten per cent. There are two complete concentrating plants in operation, both of which are owned by the John Jackson Company and are each equipped with two boilers, sixty and forty horse power, one heavy engine, a fourteen-inch crusher, two sets of rolls, steam jigs with a five cell rougher and a six cell cleaner, three elevators, one screen, one steam hoister and one six and one eight-inch Cook pump. One of the above plants is known as the Jack Johnson. About sixty-five men are employed at the two plants.

WEBSTER REALTY COMPANY.

This company is composed of E. Webster and W. T. Wood of Joplin, Mo. They control a lease on forty acres of mineral land situated about three miles west of Joplin, near Central City and pay a royalty to the land owner of twelve and one-half per cent on all minerals mined. There are seven shafts sunk on the land ranging in depth from seventy to ninety-three feet, all of which have entered ore but are just being opened up and show but little in the way of production.

The land produces both lead and zinc ore and a royalty of twenty per cent on zinc and twenty-five per cent on lead ore mined is charged operators on the land. The company has erected a complete concentrating mill equipped with an eighty horse power boiler and two engines, thirty and forty horse power, a fourteen-inch crusher, rolls, elevators, screens, steam jigs, steam hoister and one eight-inch lift pump. The lease was recently purchased of the Delaware Mining Company, which was composed of Baldridge & McHenry. The property is under the management of O. T. Hafford of Central City.

BASCOM LEASE.

This lease is situated about two miles east of Joplin and is the property of Fred Basom of Joplin, Mo. The lease comprises forty acres of valuable mineral land at the very low royalty of five per cent. There are five shafts sunk ranging in depth from 128 to 160 feet with lead and zinc ore developed in each shaft. The ore occurs in open ground which requires timbering for the support of the drifts. It would appear that extensive ore bodies exist here as the ore is encountered at the 100 foot level and continues to the depth of 150 feet. The developments are new and of sufficient richness to warrant the belief that very profitable mining will be had. There is in operation a seventy-five ton concentrating mill, equipped with one eighty horse power boiler, one thirty horse power engine, a ten-inch crusher, one set of eighteen-inch rolls, steam jigs with three cell rougher and a five cell cleaner, elevators and screens, steam hoister and one Duplex Worthington pump. The mines are under the management of S. A. Wolfe, of Joplin, Mo.

REX MINING AND SMELTERING COMPANY.

The Rex Mining and Smelting Company is incorporated under the laws of Missouri with a capital stock of \$250,000. The officers of the company are Ed. D. Porter of Joplin, Mo., president, treasurer and general manager; W. H. Picher, secretary; O. H. Picher, first vice-president, and Jas. M. Carpenter, second vice-president. The above named gentlemen are also directors of the company and associated with them is Jas. Campbell of St. Louis, Mo. The company owns in fee simple 1,005 1-2 acres of mineral land situated about two miles east of Joplin on which there are about thirty-five producing shafts or in pay ore. The shafts range in depth from sixty to 145 feet and are in open ground which requires timbering for the support of the drifts. The company does only a leasing business, charging the operators a royalty of twenty per cent on all minerals mined with the requirement

that the operators do their own draining of lands. The company keeps two drills in operation and allows no shaft to be sunk on the land except on a drill hole which has demonstrated the ore presence in sufficient quantity to warrant the sinking. The special inducement offered enables the company to secure companies with ample capital to develop and mine the land. There are eight complete concentrating mills in operation on the land as follows:

The March Mining Company, which was recently sold to the Rex Mining Company, June Mining Company, Manheim Mining Company. Dixon & Good Mining Company, Livermore & Company, Morgan & Munger Mining Company, Pill Mining Company, and Stevens & Company. There has been produced since January 1, 1899 to October 1, 840,850 pounds of lead and 4,448,670 pounds of zinc ore, from which the company received a royalty of \$17,708.61. There have been produced from the land since May, 1892, to October 7, 1899, 67,302,720 pounds of zinc and 17,090,070 pounds of lead ore which sold for \$1,061,280.20. While this showing is most remarkable, the land is in better shape now than ever before in the matter of development and new concentrating mills and will doubtless increase in production enormously.

THE MOCKING BIRD MINING COMPANY.

This company is incorporated under the laws of Missouri, with a capital stock of \$6,000, with O. W. Buck, president; H. L. Conklin, secretary and treasurer, and Henry Wood, superintendent, all of Joplin. Mo. They own a lease on ten acres of land situated just to the west of Joplin which is owned in fee simple by Lane & Son. They pay a royalty of fifteen per cent on all minerals mined and have seven shafts sunk ranging in depth from thirty-five to ninety feet with lead and zinc ore developed in each of them. The ore deposits are very rich and occur in medium ground which does not require the use of timber for the support of the drifts when properly cut. These mines are new, having been opened up recently and a complete concentrating mill erected, supplied with an eighty horse power boiler, a forty horse power engine, a twelve inch crusher, two sets of medium sized rolls, steam jigs with a four cell rougher and a four cell cleaner, three elevators, screens, one steam hoister and two horse hoisters. About fifteen men given employment and from twenty-five to thirty tons of zinc and about 10,000 pounds of lead ore produced per week.

BEACON MINES.

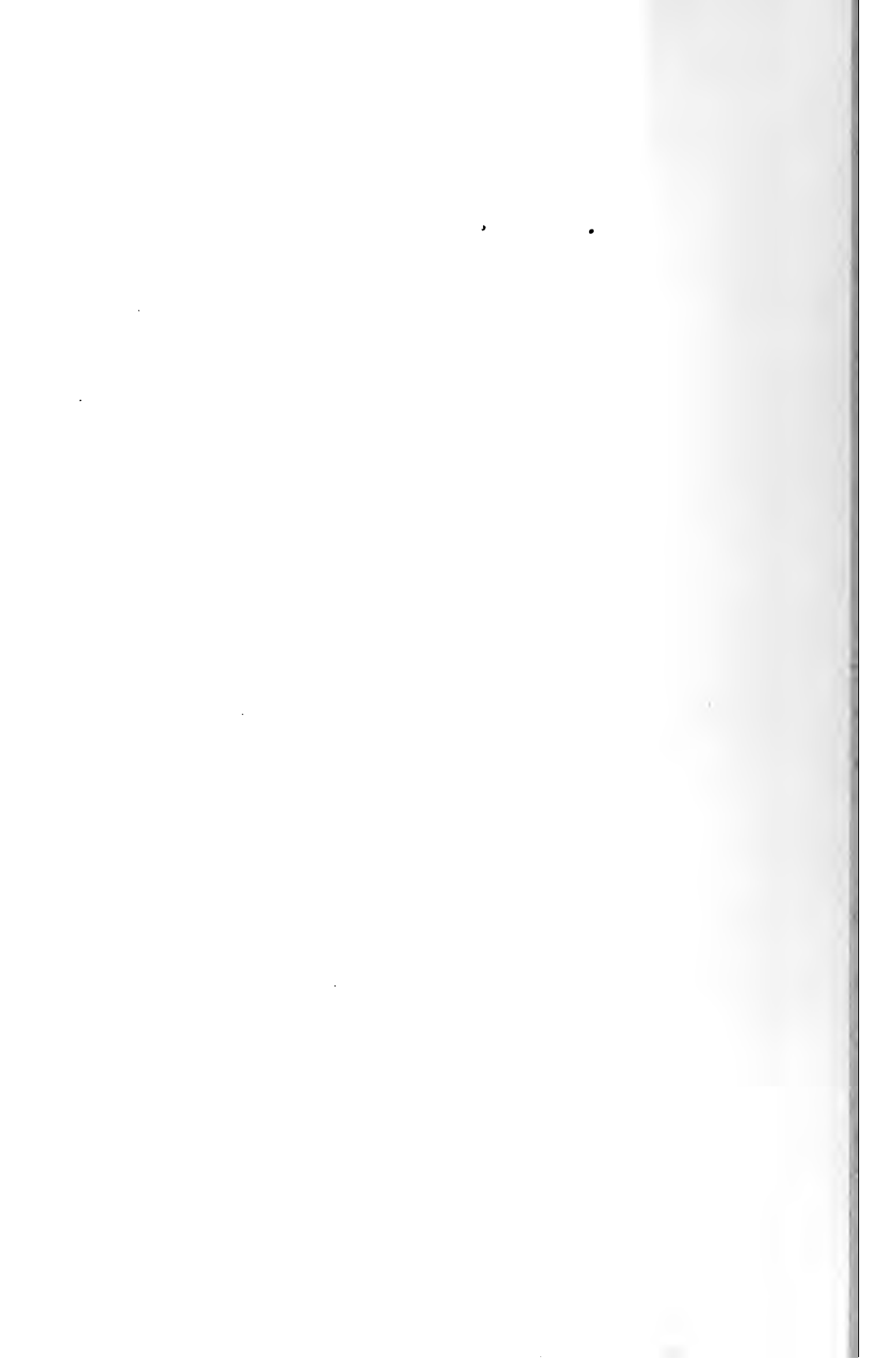
The "Beacon" is a lease containing twenty acres situated about two miles east of Joplin and is the property of C. O. Frye, of Joplin, Mo. The lease is a good producer of lead and zinc ore and is well located with reference to other good producing mines. There are seven shafts sunk on the lease ranging in depth from seventy to 117 feet in open ground which requires timbering for the support of the drifts. The ore is encountered at about from fifty to 112 feet below the surface and has proven to be very rich, the production reaching from \$1,000 to \$2,000 per week when in regular operation. There has been mined and sold during the past twelve months, \$80,000 worth of lead and zinc ore. There are five of the seven shafts which have entered the ore, the last being sunk in two weeks at a cost of \$8,000, from which sufficient lead was taken out at a depth of forty-nine feet in three hours' time to pay the expenses of sinking the shaft. The land is owned by the Uncle Sam Mining Company and the dividends from it go to London and Liverpool.

REX ZINC AND LEAD COMPANY.

The Rex Zinc and Lead Company is incorporated under the laws of New Jersey and is composed of eastern gentlemen, with C. O. Frye, of Joplin, Mo., as manager. The company is operating a lease of forty-five acres of mineral land owned in fee simple by the Rex Mining and Smelting Company and is situated about two miles southeast of Joplin. There are six shafts sunk ranging in depth from sixty to seventy feet with ore developed in four of them. The drifts are cut eight by ten and eight by twenty feet in hard ground which require no timbering for their support. This company has a complete concentrating mill equipped with one eighty horse power boiler and a sixty horse power engine, a sixteen inch crusher, three sets of rollers, twenty-two, eighteen and sixteen-inch, steam jigs with a five cell rougher and a six cell cleaner, four elevators, two screens, four steam hoisters and three pumps, an eight and a six-inch Cook, and one eight-inch lift.

THREE FRIENDS ZINC MINING COMPANY.

The Three Friends company is incorporated under the laws of Missouri with a capital stock of \$350,000. Its officers are D. J. Taussig, of St. Louis, president; Mr. Hitchcock, of St. Louis, secretary;





and Thos. H. Fisher, of Carl Junction, Mo., as manager. The directors are G. B. Young, of Joplin, Mo.; D. J. Tausig, E. Catlin, of St. Louis, and others. The company owns 160 acres in fee simple and a lease on 160 which is owned in fee simple by G. B. Young and W. M. Leckie, of Joplin, Mo., the lease being subject to a royalty of ten per cent. There are eleven shafts sunk on the land ranging in depth from 120 to 160 feet, nine of which have entered the ore body at 100 feet below the surface and show ore at 160 feet. The ore occurs in medium ground which requires some timbering for the support of the drifts, and is of a very high grade, bringing the top of the market. There are about fifty men employed on the property and the production will reach 100 tons of zinc ore when the mines are in regular operation. There are two mills in operation, one of them known as the Springfield Company owned by Fred Wishart and others. It is a complete concentrating plant of a 100 tons capacity. The other is owned by Clark & Company and is also complete and modern in all its parts. Besides these mills, there are hand jig plants in operation. The Three Friends company has in course of erection one of the most complete and modern plants in the district. When completed, it will be equipped with two 100 horse power boilers, a seventy-five and a forty horse power engine, one sixteen-inch crusher, three sets of large rolls, a five cell rougher and a six cell cleaner, steam jigs, Wilfley tables, two screens, four elevators. Besides the above, there are seven steam hoisters in use on the lease and the ground is drained by eight and ten-inch Cornish lift pumps. This mining property is situated about seven miles to the northwest of Joplin and is doubtless one of the coming large producing properties of the Joplin district. A part of the ore is hauled to the Memphis Belleville switch for shipment while a part is hauled to Carl Junction, two miles distance, from which point, it is shipped over the Frisco railway.

GRANBY MINING AND SMELTING COMPANY.

This company is organized under the laws of the State of Missouri, with head offices in St. Louis. D. D. Burns is president; L. C. Burns, vice-president; E. S. Gatch, secretary, of St. Louis; and J. H. Stephens, of Joplin, superintendent of the company's lands and business in Joplin. The company owns a large acreage of land and also controls some by lease, being owners of an undivided interest. The company does no mining and no draining, leasing the land in lots to operators on a royalty of ten to twenty per cent. The company has expended considerable money in drill prospecting and by this means developed

in the past two years parts of their land formerly believed to be barren, finding ore deeper than the old workings, of a disseminated character that required milling. Some very rich discoveries have been made at depths ranging from 100 to 250 feet deep.

Rafael Estrada has a lease of six lots, operates one shaft and is producing ore from the 140 foot level, from which three drifts are run in hard ground, carrying a 20-foot face of very rich disseminated ore bearing dirt. Mr. Estrada has just completed a new 100 ton mill equipped throughout with modern machinery.

The Blackberry mine, developed by H. B. Crossman & Co., of Joplin, has just been purchased by Messrs. Johnson, Bothfeld & Fay, of Boston. The lease comprises six lots, has one shaft producing ore from 135 foot level, on which two drifts are run, carrying a twenty-two foot face of ore bearing dirt in hard ground. A new mill has recently been completed and another shaft is being sunk on a drill well that marked a rich run of ore at 100 feet. The company has also a drill well 200 feet deep for water supply for the mill that has the same ore markings. Included with the purchase of the Blackberry was the purchase of the Raspberry, a lease of eight and one-half lots adjoining on which the same ore level was developed in three drill wells, making the best showing of any like property on the Granby company's land here. It may be said in conjunction that these properties join the Estrada and Blakey No. 2, both of which are continuations of this development.

The Blakey No. 2 mine is owned by Edward O. Atkinson and A. C. Hartley, of Joplin, the latter acting as superintendent. They have four lots and are producing zinc ore from the 140-foot level, and also have an upper run, chiefly lead ore at seventy feet. They are carrying three drifts, with an eighteen-foot face of ore bearing dirt in hard ground.

The Locust Mining Company's property is managed by Wm. Leggett, of Joplin, and T. F. English, of Kansas City, is secretary. The Locust has a lease of seven lots and have three shafts down to the ore level at 150 feet. This is an old mine and has many drifts, the owners now working on the 130-foot level on a face of lead and zinc bearing dirt. The company has a mill and produces about fifteen tons of zinc and five tons of lead when running regularly.

The National Mine Company, of Kansas City, has three properties on the Granby land, the Chicago Lead and Zinc Company, the

Leadville Hollow Zinc Mining Company and the Novelty Zinc Mining Company. These properties have lately been absorbed by the National Zinc, Lead and Smelting Company, of New York. The two former are in Leadville hollow and the latter in Lone Elm hollow. F. B. Wilcox, of Kansas City, is secretary, and C. N. Stark, of Joplin, is superintendent of the three properties. The Chicago is incorporated for \$50,000; the Leadville and Novelty each for \$100,000. The Chicago property embraces twelve lots and has three shafts 150 feet deep. The working level is 130 feet in hard ground. Besides the developed mines there are several drill holes indicating a pretty general run of ore. The Leadville has six lots and three shafts to 160 in depth. Two of these are producing from the 130-foot level, drifting in hard ground. There is a 100 ton mill over each of these mines, and they are capable of producing thirty to forty tons of zinc ore per week. The Novelty is mostly operated by sub-lessees, there being a number of miners operating on the lease in a small way. The Novelty has a 100 ton mill and does custom cleaning for the sub-lessees and is milling a lot of rich hand jig tailings on the ground from operations years ago when ore was not saved near so close as now. The Novelty lease embraces twenty-five lots in Lone Elm hollow, close to town, and has been a producing property for many years, the work being done principally at a shallow depth. On this lease there is one steam pump and three steam hoists, all the machinery besides the company's mill.

There are two tailing mills on the Granby company's land. With these mills there is no lease of lots farther than a surface right for waste. Oswald & Co. have a mill in Leadville hollow with a capacity of twelve tons per week of clear ore, and Wm. Brugger has a mill in Poor Man's gulch of a like capacity. The owners of these mills go over the old dumps of waste from hand jig cleaning and the fact that they can make fully twelve tons of ore to each mill every week is strong evidence of the loss by hand cleaning. There are dumps on this land to keep these mills running for several years if the market price of ore keeps high enough. The ore thus obtained is just as high in assay quality, but is "chatty," a local term for ore carrying foreign matter, which depreciates its commercial value, usually selling \$5 to \$8 per ton less than mine run ore.

The Burlington mine is superintended by E. R. Moffet, of Joplin, operating on two lots, with one shaft 135 feet deep. There are two ore levels being worked, one at eighty feet, the other at 130 feet, with a small strip of dead ground between. The ground has been producing for a number of years and has turned out a large amount of both

zinc and lead ore. The lead ore was shallow and all developed deposits have been cut out. A new mill has been completed of 100-tons capacity. With this the property is capable of producing twenty to thirty tons of zinc ore weekly.

J. W. Kelly and Fred G. Barker, of Pennsylvania, have a lease on four lots, on which there are three shafts to a depth of 130 feet, all in ore. Only one mine is being operated, and it is producing ore from two levels, at eighty and 130 feet, each level having an ore face of twenty feet. A new mill has just been completed ready to be started. The ore is found in disseminated hard ground.

The Silent Friend Mining Company is a private company composed of Gotthelf, Sutton, Jones Bros. & Co., of Joplin. A shaft is being put down on a drill hole that marked ore at 102 feet. The shaft encountered ore at eighty-feet.

The Willow Mining Company is composed of W. Rosenbury, S. Shafer, and C. H. Petters, of Joplin. They have five lots and are producing lead and zinc from the seventy-foot level, carrying a ten-foot face in hard ground. The dirt is cleaned on hand jigs.

J. W. Kirkbride and S. N. Priddy own the Edith mill and mine, having a lease of eight lots. They have one shaft 130 feet deep and are drifting at 128 feet on a thirty-foot face of zinc bearing dirt in hard ground. There are three drill wells on their lease marking ore deposits from eighty to 150 feet.

A. W. Wilgus has five lots and is operating two shafts at seventy and eighty feet in timbering ground. The ore is cleaned on a mill.

Rush & Mills are reclaiming twelve lots in Poor Man's gulch, so named because large deposits of ore were found there at shallow depths. The ground is being drained with a ten-inch lift pump.

The Corn Palace Mining Company has a lease of ten lots in Lone Elm hollow and are pumping with four steam pumps at a depth of only seventy feet. L. N. Radcliff, of Joplin, is superintendent and the company is mining on four lots. Four lots are sub-let to J. W. Lemley, who is taking out lead and jack at seventy feet, and two other lots are being worked on a sub-lease by the DePush Mining Company at thirty feet, where they are taking out jack from hard ground. All these mines use hand jigs.

Rush & Mills have just sold a lease on ten lots in Lone Elm hollow, comprising three shafts in lead and zinc at forty-five feet, two

steam pumps and a hand jig plant. It is timbering ground and while it has produced considerable lead in former days its present capacity is not fully developed.

SULLEY & CO. (LONE ELM).

This company has recently purchased of E. N. Perry his lease of 190 acres of land, part of which is owned in fee by the Picher Lead Company, part by the Granby Mining and Smelting Company and part of which is town lots in the Wilson & Hutton addition. It lies within the city limits to the northwest of the business center and is among the nearest in mines of Joplin. The company is operating three pumping stations, using the Cornish lift or beam pump. At No. 1 station there are two fifteen-inch pumps, at No. 2 and No. 3 there are two twelve-inch pumps. At No. 1 Mr. Perry, the former owner, had a reserve of thirty acres and a mill, and in one year marketed \$70,000 worth of zinc and lead ore. With No. 2 there is a reserve of only three acres and this has been operated only slightly, and No. 3 has a reserve of ten acres, only partially developed. Nos. 1 and 2 are drained to the 130-foot level and No. 3 to the 150-foot level. The mill at No. 1 has a capacity of 150 tons and has handled as high as 170 tons to the shift. It is provided with an eighty horse power boiler and a forty horse power engine. The dirt is cut from the 130 foot level in hard disseminated ground. No. 2 and No. 3 have each a fifty horse power boiler and engine.

About twenty hand jig properties have been operated by sub-lessees and during the year marketed \$60,000 worth of ore. These properties operated in shallow ground, all above eighty feet, and used from one to three hand jigs in the concentration of ore from the chert. The largest of the hand jig properties is owned by J. W. Perry, cutting on the seventy-foot level, and using four hand jigs, averaging ten tons of zinc and a small amount of lead weekly.

E. V. Wyssbrod & Co. have four lots which have been operated by hand jigs and is building a 100 ton mill.

Rose & Miller are operating two lots on the Lone Elm lease and have opened up good deposits of ore at the depth of thirty-five feet. They use a horse hoister and clean the ore on three hand jigs.

Goorich Bros. control three lots of the Lone Elm lease and are operating at the level of 105 feet. They have a good deposit of lead and zinc ore developed.

Brown & Company operate one lot of the Lone Elm lease at a depth of sixty feet with a fair face of ore developed. They use a steam hoister and three hand jigs.

Piggs Foot Mining Co. operate one lot of the Lone Elm lease and is working at the depth of seventy-five feet. The dirt is hoisted by horse power and the ore cleaned on two hand jigs.

Seven or Eleven Mining Company controls three lots of the Lone Elm lease and operate two shafts at the depth of ninety-five feet. Their improvements consist of a steam hoister, one ten-inch lift pump and four hand jigs.

Geiser & Company control four lots of the Lone Elm lease and mine the ore at the 100-foot level. They use a steam hoister and four hand jigs. Sufficient bodies of ore have been developed at this shaft to warrant the erection of a concentrating plant which will be done soon.

Ferguson & Company have four lots of the Lone Elm lease and two shafts sunk to the depth of 100 feet with fair ore developed and make a weekly production of from 8,000 to 12,000 pounds of lead ore. Their improvements consist of two steam hoisters, one Cornish ten-inch lift pump and three hand jigs.

The Winnie Mining Company, known as the "Old Shoe," controls four lots of the Lone Elm lease and has one shaft to depth of 120 feet. Very fair weekly productions are made.

Bacon Mining Company is operating on the Lone Elm lease and control five lots. Their shaft is down to the depth of ninety-eight feet with good lead and zinc ore developed on which a royalty of twenty per cent is paid. They have a concentrating mill erected at a cost of about \$6,000, supplied with ample boiler and engine power, crusher, rolls, elevators, screens, six and seven cell steam jigs and a steam hoister.

THE EMPIRE ZINC COMPANY.

The Empire Zinc Company, which was organized about ten years ago with W. C. Wetherell, of Joplin, Mo., general manager, made large investments in developed and undeveloped mineral lands in Jasper and Newton counties, Missouri, and Cherokee county, Kansas, and also purchased the zinc smelters at Joplin, Mo., which it has operated continuously. The stock-holders of the "Empire" are also members of the Lehigh Zinc and Iron Company, of Bethlehem, Pa. The first

his company was on what is known as the Eagle track of Joplin, from which land large quantities of ore when prices went down, operations were not so active. Presenting a more active appearance and will doubtless hold its old time place among the producers of the district. It was so owned until recently, the Kohinoor tract containing within the western limits of Joplin. This tract has also been a producer of both lead and zinc ore and has now in it a number of well equipped concentrating mills. The Kohinoor tract from the depth of eighty-five to 175 feet in which does not require the use of timbers for the support is now properly cut.

THE AJAX MINING COMPANY.

The company is incorporated under the laws of Missouri with a capital of \$150,000 and officered with J. F. Wallach, of Chicago, president, treasurer, and Chas. W. Markus, of Chicago, as secretary. Vail, of Joplin, Mo., superintendent. The company owns seventy acres on the Snapp & Dixon land situated north of Joplin and pay a royalty of ten per cent on production. Nine shafts have been sunk on the land ranging in depth to 200 feet. The ground is open and requires timbers.

Ore has been developed in eight of the nine shafts, which are now being operated or opened up for active mining. The company has many sub-leases to operators and also operates a mill. The mill is complete and is equipped with a 100-horse power engine, two sets of twenty-four-inch flat rolls, one revolving screen, elevators, steam jigs, rougher and a six cell cleaner, two steam hoisters, two large steam, and two eight-inch lift pumps with which it is mined. The company employs twenty men at its plant and makes weekly productions. Following are some of the operations.

The Klondike Mining Company.

The company is composed of Mrs. Troutman, of Joplin, who are operating four lots of the Ajax lease and have sunk shafts to a depth of 150 feet with a fair face of lead and zinc ore on which they pay a royalty of ten per cent. They recently erected a new and complete mill supplied with one fifty horse power engine, one fourteen-inch crusher,

steam jigs with a four cell rougher and five cell cleaners, rolls, screens, elevators, steam hoister and one three-inch discharge steam pump. The mines are managed by Reed Hoglen, of Joplin, Mo.

Monser Mining Company.

This company is composed of W. E. Monser and Dr. Morical, of Joplin, Mo. They control five lots of the Ajax lease at a royalty of twenty per cent and have two shafts sunk, one to 140 and the other to the depth of 170 feet. The ore has been developed in both shafts and is mined at the levels of 140 and 160 feet; lead being the only mineral mined. The ground at these mines is also open and requires timbering. The improvements consist of a thirty and a fifty horse power boiler, two steam hoisters and four hand jigs. W. E. Monser is the superintendent.

Sargeant Mining Company.

The property controlled by this company embraces four lots of the Ajax lease which was recently sold to eastern parties. One shaft has been sunk to a depth of 200 feet which developed zinc ore from 145 to 195 feet below the surface in open ground which requires the use of timbers for its support. The dirt hoisted here is of a good percentage zinc ore. About thirteen men are employed and an average production of about twenty-two tons of zinc ore is made per week. They use a steam hoister, two four-inch discharge steam pumps and clean the ore on four hand jigs.

Bull Pup.

The owners of this property are Henry Baum, of Joplin, Mo., Manager, Jos. Long, Chas. Huddleson, Ike Rusk, James Moore, and David Warren. They control four lots of the Ajax lease and have three shafts ranging in depth from 137 to 150 feet. Ore has been developed in each shaft at the 135-foot level in open ground which requires timbers for the support of the drifts. Fourteen foot ore faces are being cut and the dirt is of a good percentage ore. The mine is new and carries both lead and zinc ore. The machinery consists of a pump, steam hoister and four hand jigs.

The Mayflower.

This company is composed of Jos. Connard, manager, Mr. Weir and others, of Joplin, Mo. They are operating four lots of the Ajax lease at a royalty of twenty per cent and have one shaft to the depth of 156 feet with a fair face of lead and zinc ore developed at 140 feet below the surface in soft ground which requires timbers for the sup-

port of the drifts. The mine is new and not sufficiently opened up to work to advantage. They have a twelve horse power boiler, a steam hoister and two hand jigs.

INDIAN RIVER RYE MINING COMPANY.

This company is incorporated under the laws of Missouri and is composed of Wm. Fahrman, Ben. Ensing and John Varner, of Webb City, Mo., and John Spingler, of Kansas City, Mo., with Mr. Fahrman as secretary and Mr. Varner superintendent. Their lease covers twenty acres of the Triad lease formerly known as the East Free Coinage, situated about two miles northeast of Joplin. The lease was secured for a term of ten years at a royalty of seventeen per cent and has about eight years of unexpired time. The twenty acres have been surveyed into twenty-one mining lots and there have been seven shafts sunk ranging in depth from seventy-five to ninety feet with ore developed in all of them, but only a part are being worked. The land carries both lead and zinc ore which have been developed at different levels from thirty feet down. Besides the company's developments at its shaft, the Sunflower company adjoining on the north, has developed a very rich deposit of zinc ore which continued from fifty-seven to seventy-five feet. This will doubtless develop into a paying mine. There are twenty-one men employed and the production reaches from twelve to twenty-five tons of zinc and from 3,000 to 10,000 pounds of lead ore per week. There is a complete pumping plant in operation supplied with three boilers, eighty, thirty and ten horse power, a three and a four-inch discharge and an eight-inch steam head pump, steam hoister and seven hand jigs.

BECKEY SHARP MINING COMPANY.

The "Beckey Sharp" is incorporated under the laws of Missouri with a capital stock of \$25,000 and is officered as follows: Andy F. Donham, of Joplin, Mo., president; Senator F. W. Mott, of St. Louis, Mo., vice-president; and F. R. Mott, whose local residence is at Joplin, Mo., secretary. The company owns a lease at ten per cent royalty on forty acres of the Snapp land, situated at Tuckahoe, about three miles north of Joplin and which is under the management of the president, Mr. Donham. They do only a sub-leasing business and charge operators a royalty of twenty per cent on all minerals mined. There are nine shafts sunk on the lease ranging in depth from 140 to 160 feet with ore developed at different levels from 100 to 160 feet below the

surface. The ore is free and of a high grade, and occurs in open ground which requires timbers for the support of the drifts. The dirt hoisted is very rich, running from ten to thirty per cent zinc ore. Following, we mention some of the operators on the "Beckey Sharp"

The Grand Master Mining Company.

This company is incorporated under the laws of Missouri and capitalized at \$10,000, with T. J. Taggard as its president, Hon. F. W. Mott vice-president, and A. F. Donham secretary and treasurer. The company is operating four lots of the Beckey Sharp lease and has four shafts sunk, ranging in depth from 135 to 160 feet with zinc ore developed in each shaft in open ground which requires timbers for the support of the drifts which are cut about twelve feet wide. The dirt is very rich in free ore, the production reaching about one thousand dollars' worth per week. The company has a complete soft ground plant, equipped with a forty horse power boiler and a twenty-five horse power engine, a steam rougher, two steam hoisters and four hand jigs. They pay to the Beckey Sharp company a royalty of twenty per cent and employ twelve men.

The Vulture Mining Company.

This company is composed of Messrs. Shriner & Webster, of St. Louis, Missouri, who are operating three lots of the Beckey Sharp lease and have two shafts sunk, one to 100 and the other to 160 feet in depth with rich zinc ore developed in each. The ore here, like the Grand Master, is free and occurs in open ground which requires timbers for the support of the drifts. The company is just reopening the mine and is putting in a complete soft ground plant with which to handle the dirt. The improvements consist of a forty horse power boiler and a twenty-five horse power engine, a steam rougher, steam hoister and four hand jigs.

NORTH HEIGHTS MINING LAND.

This property consists of the unsold lots of the North Heights Addition to the City of Joplin, being situated in the north of the city and is owned in fee simple by D. H. Hart, of Lincoln, Illinois, who leases the lots to operators at a royalty of fifteen per cent and has assigned the management of the property to Mr. Frank L. Yale, of Joplin, Mo. There are 104 of these lots leased to S. E. Hubbard and D. H. Baldridge, of Joplin, Mo., who sub-let to operators at a royalty of twenty-five per cent.

Hubbard & Baldridge, the lease owners, have five Snow steam pumps in operation and will place additional pumping capacity for a

more effective drainage. The land is now drained to the depth of 110 feet, at which level the greater portion of the mining is done. There are eleven mines in operation on this property which pay a royalty of twenty-five per cent to the lessees. At the fifteen per cent royalty which is paid the land owner, this property has yielded a weekly dividend of \$275.56 for the ten weeks prior to August 1st, 1899. The general line of improvements on this property consists of steam hoisters and hand jigs and horse hoisters and hand jigs.

Rias & Co., who are operating on the Hubbard & Baldrige lease, have a steam hoister and clean the ore on hand jigs, and produce from fifty to seventy-five tons of zinc and from 5,000 to 10,000 pounds of lead ore per week. The other operators on this land are the B. C. B. Mining Co., War Eagle, K. C. K. Mining Co., Georgia City Mining Co., A. Waite & Co., the Mayflower No. 1, No. 2, and No. 3, the Ethel E., Old Atlas and Wa Hoo M'g Co.

Barbee & Yale.

This company is composed of Gilbert Barbee and Frank L. Yale, of Joplin, Mo., who own a lease containing forty acres of mineral land which is situated about one mile north of Joplin, and is owned in fee simple by Wm. H. Phelps, of Carthage, Mo. This company has two pumps in operation with which the ground is drained. They first drilled the ground and penetrated the ore body for a distance of from forty-five to fifty feet and are now developing a very large and rich face of lead and zinc ore. Two concentrating plants will be erected on this land by early fall; one by Barbee, Yale & Co., and the other by Malone & Co., of Joplin, Mo.

THE WRIGHT LEASE.

The Wright lease is owned by Frank L. Yale, of Joplin, Mo., W. A. O'Brian and J. L. Zeidler, and contains twenty acres of land situated about two miles northwest of Joplin. There are three shafts operated on the land and considerable prospect work being done. This company pays a royalty of ten per cent to the land owner and is under the management of Mr. Yale who sub-leases to operators at a royalty of twenty per cent, the company operating no mines. The following are operating on the "Wright."

Chas. Hart & Co.

This company is operating on the Wright land and controls five lots at a royalty of twenty per cent. They have two shafts down to a depth of 120 and 160 feet respectively, and are in very rich zinc ore about sufficiently developed for regular weekly turn-ins.

The Keno Mining Company.

The "Keno" company controls four lots of the Wright lease with one shaft down to the depth of 140 feet and working on a thirty-foot face of zinc ore. They employ fourteen men and produce from fifteen to twenty tons of zinc ore each week and pay a royalty to Yale & Co., lessees, of twenty per cent. There is a complete concentrating mill in operation here supplied with one eighty horse power boiler, a thirty-five horse power engine, one fourteen-inch crusher, two sets of twenty-inch rolls, steam jig with a five cell rougher and a six cell cleaner, a revolving screen, elevators, steam hoister and one steam pump.

Old Hickory.

The "Old Hickory" is owned by H. C. Cosgrove & Co., who control five lots of the Wright land with two shafts down to a depth of about 145 feet and a face of ore developed at about the ninety-foot level. A great deal of ore has been taken from this ground in the past, but abandoned until this company took charge. They expect to be making regular turn-ins at a very early date.

YALE & O'BRIAN.

This company is composed of Frank L. Yale, of Joplin, Mo., W. A. O'Brian and J. L. Zeidler, with Mr. Yale as manager. This lease contains forty acres belonging to the John Jackson estate, being the N. W. of S. E. quarter, section 32, township 28, range, 33, and is situated about two miles northwest of Joplin. A royalty of ten per cent is paid to the land owners and twenty per cent charged the operators. The company lease to operators, doing no mining themselves. This is a good tract of mineral property and is expected to increase rapidly in the production of ore. The following are the principal operators on the Yale & O'Brian.

A. B. Wilgus & Co.

The Wilgus company controls eight lots of the Yale & O'Brian lease and has two shafts down to a depth of 120 feet with good lead and zinc ore in each. They are cutting on a face of ore about thirty feet wide and about fifty feet high and produce fifteen tons of zinc and about 15,000 pound of lead ore per week. The company's improvements consist of an eighty horse power boiler and a thirty horse power engine, a crusher, rolls, pump, steam hoister and ten hand jigs.

BOB MOORE MINING COMPANY.

The "Bob Moore" is composed of R. A. Moore, Frank L. Yale,, A. M. Wagner and J. A. Meeks, with Mr. Yale as manager. They have a forty acre lease described as the N. E. of the N. W. quarter of section 4, township 27, range 33, being situated about two miles north-west of Joplin. The land is owned in fee simple by John H. Taylor who receives from the company a royalty of ten per cent while the lessees charge operators a royalty of twenty per cent. There are four shafts sunk on the ground to a depth of 110 feet in which the ore bodies are developed at the eighty foot level. Following are the operators on the Bob Moore tract.

Wagner & Company.

Wagner & Co. are operating three lots on the Bob Moore and have three shafts down 110 feet but are hoisting from only one shaft. They employ twelve to fifteen men and produce from ten to fifteen tons of zinc ore per week. The ground is soft and has to be timbered. The improvements consist of one lift pump, a belt hoister and five hand jigs. The mine is under the management of Ed. Hodges.

The Yellow Jay.

This company is composed of W. W. Norman, J. M. Murdock, J. Montgomery and F. S. Whitwell. They operate six lots on the Bob Moore lease on which they pay a royalty of twenty per cent and have two shafts down to eighty and 100 feet respectively with ore faces developed in each shaft. This mine is new and is not sufficiently developed to produce more than eight or ten tons per week. They employ twelve men and the improvements consist of an eight-inch lift pump, steam hoister and hand jigs.

Lawrence & Company.

The members of this company are W. J. Briggles, J. Lawrence, Carl Bryan, W. T. Roach, H. A. Smith and Fred Scott. They operate two lots of the Bob Moore land and are doing development work at 110 feet from the surface. Their machinery consists of a pump, steam hoister, etc.

R. A. Moore & Co.

This company operates four lots of the Bob Moore land and has one shaft down to a depth of 110 feet in good ore from which regular productions will soon be made. They have an eight-inch pump and steam hoister and will add other machinery as the mine is developed.

BEN BOGY MINING CO.

This company is composed of Lee Taylor and Ben Bogy, of Joplin, Mo. They control by lease thirty-two acres of the Montgomery Mining Company's land at a royalty of ten per cent. The company does a sub-leasing business, doing no mining as a company. The land is situated about two and one-half miles northwest of Joplin and is well located with reference to other producing mines. There are two shafts sunk on the land to the depth of 110 feet one of which is being operated at 105 feet from the surface and a good face of zinc ore being developed in ground sufficiently hard that timbers are not required for the support of drifts when properly cut. There are seven ground and five top men employed with a fair production of zinc ore. A complete concentrating mill just completed at a cost of \$4,500 equipped with two sixty horse power boilers, a 45 horse power engine, one twelve-inch crusher, one set of eighteen-inch rolls, steam jigs with a four cell rougher and a four cell cleaner, three elevators, one revolving screen, one steam hoister, one eight-inch lift pump with which the ground is drained. There is also a tailing mill in course of erection. This lease is under the management of Lee Taylor, of Joplin, Mo.

MONTGOMERY MINING CO.

Clinton Mining Company.

The Clinton Mining Company is composed of J. B. Steele, Mr. James and others of Clinton, Mo., who contract by lease twenty-eight acres of the Montgomery Mining Company land at a royalty of ten per cent. They have three shafts sunk with the ore body developed in two of them at sixty feet below the surface. Like most of other developments on this lease, these are new but very promising. An eight-inch pump and belt hoister are in operation. The lease is under the management of J. B. Steele who has sub-leased lots to Burns & Co. and Cooper & Co.

R. E. Roth.

R. E. Roth, of Fairfield, Iowa, owns a ten acre lease of the Montgomery Mining Company's land at a royalty of ten per cent. There is a pump in operation for drainage purposes, while a steam hoister is used for hoisting the dirt, with seven men employed, about three tons of zinc ore per week are produced.

Black Flag.

This lease embraces ten acres of the Montgomery Mining Company's land and is owned by John Nichols, W. S. Scott and others of Joplin, Mo. They have a lease for a period of ten years which is sub-

ject to a royalty of ten per cent. The ore is mined at from twenty to forty feet from the surface and with six men they are producing about four tons of zinc ore per week. A lift pump is used for drainage purposes and the ore is cleaned on hand jigs.

Becker, McClaren & Weaver.

This company has a lease on forty acres of the Montgomery Mining Company's land. They have a two-inch lift pump in operation, steam hoister. The developments are new and productions moderate.

NORTON LAND.

What is known as the Norton land comprises seventy acres situated just to the west of Joplin and has the Taylor land adjoining on the north and the Kohnoor mining land on the south. The land is only partly developed but from existing ore deposits shown on the adjoining lands, the land will certainly prove profitable for those engaged in mining it. Out of thirteen drill holes, it is reported that eleven of them penetrated the ore body. There are five shafts ranging in depth from twenty-eight to 175 feet which are showing mineral and it appears to us that only development work is necessary for this land to become a good producer.

The Boqua Mining Company.

The "Boqua" is composed of E. L. Anderson, Mr. Elliott and others of Joplin, Mo. They operate on five lots of the Norton land with a large face of ore developed at the 115 foot level in hard ground. These developments are new and the company has just erected a large and complete concentrating mill at a cost of \$10,000. The plant is modern in every particular and is equipped with two seventy-five horse power boilers, one eighty horse power engine, one double twelve-inch crusher, three sets of twenty-four-inch rolls, one revolving screen, three elevators, steam jigs with five cell rougher and a six cell cleaner, one Freeman double steam hoister, one Leyner four-drill air compressor with which the ground is broken, and one Worthington pump. The company will develop and work the ground at the 130 foot level.

THE JOHN H. TAYLOR 100 ACRE TRACT.

This tract of mineral land comprises 100 acres situated just west of Joplin and has the famous Granby tract of mineral land adjoining on the north. For various reasons the productions from this land have been lighter during the past year than formerly. The winter

was long and exceptionally severe and was noted for the sudden and extreme changes in temperature which, coming as they did many times unexpectedly, caused great damage to exposed machinery and in some cases almost totally wrecked plants. The "Big Eight" which is located on this land was shut down for some trifling repairs and the boiler being full of water was badly damaged, steam pipes were frozen and burst and the plant was so badly damaged that a great deal of expense and labor was necessary to place it in proper condition for further operations. The water came up in the ground during the long shut down and the mines was not in condition to make a turn-in from January 9 to June 3, when the mine and plant were in better condition than ever.

The I Know Mining Company.

The I Know Company is operating on the Taylor land, but for some time they have been doing dead work preparatory to more active mining and to open up some ore faces in old ground which had caved and which were very rich in ore and had not settled sufficiently to be worked with safety. These lots have been very large producers and will doubtless soon again be recorded among the large dividend payers of the district. This company has a complete and modern concentrating plant, supplied with all the necessary machinery for handling the ore.

The Sunday Mining Company.

This mining company has a lease on twelve lots of the Taylor land and has just completed one of the most complete concentrating plants in the district to mill the magnificent ore bodies developed in the old Wild Rose and Rose Leaf shafts which yielded a good profit to the old sub-lessees when cleaned by the old and crude method of bucking and hand jigging, a process always wasteful in the extreme. In the Wild Rose shaft over which the new mill has been erected, a thirty-five foot face of ore was developed at seventy-five feet below the surface and another big ore body at 130 feet, to which depth the shaft is sunk, and in the shaft of the Rose Leaf, they had ore almost continuously from 75 to 129 feet. The dirt from both these shafts will be run over the new mill. A drill hole put down just southeast of the new plant to a depth of 247 feet is said to have gone through eighty-five feet of exceedingly rich jack. The drill hole has been cased and a drift run from the Wild Rose shaft to the drill hole to enable the operators to use it for an air shaft. The company's lease runs for a period of ten years at a royalty of twenty per cent. The mill cost between \$8,000 and \$9,000

and is equipped with two seventy horse power boilers, a seventy horse power engine, a double twenty-one-inch crusher, three sets of twenty-four-inch rolls, Cooley self contained steam jigs with a five cell rougher and a six cell cleaner, two steam hoisters, an air compressor to furnish air for the air drills, and a steam end pump of ample capacity to drain the ground.

The Horse Shoe Mining Company.

This company has a lease on twenty-two acres of the Taylor land at a royalty of twelve and one-half per cent, which has about nine years to run and has two shafts down to the working level with a complete steam plant located just to the east of the I Know. They have a lease of four lots of Virgin ground which they are energetically preparing to open up and contemplate erecting a new mill later on when the developments are sufficient to warrant it.

Joplin Prospecting Company.

This company has a lease on forty acres of the Taylor land, running about five years at twelve and one-half per cent royalty, and the Bartlett Mining Company, and the Big Eight, both previously referred to, are operating under a sub-lease from this company. Among the other sub-lessees on this ground are Phillips & Company, who have shaft to the depth of 130 feet and are working on a lead run between eighty and ninety feet and are making regular weekly turn-ins. Bleackerly & Company, the Daisy Mining Company and the Ohio Mining Company are all operating on this lease.

Mingo Mining Company.

The Mingo Mining Company has a lease on twenty acres of the Taylor land at a royalty of twelve and one-half per cent which has about ten years to run. They have the ground drained to about the 110 foot level, at which depth a deposit of ore has been developed. They have developed fair ore also at ninety feet below the surface. We are informed that this company will erect a concentrating plant with which to handle the ore in the near future.

KEYSTONE ZINC COMPANY.

The "Keystone" company is composed of S. D. Wright, H. T. Coleman, F. L. Garrison and W. W. Mills, all of Philadelphia, Pa. The company operates a lease on twenty-four acres of mineral land at a royalty of ten per cent, secured from the Roaring Springs Land &

Mining Company. The lease is situated about one mile south of Joplin, and is under the management of S. J. H. White, of Joplin, Mo. There are twelve shafts sunk on the lease ranging in depth from 48 to 122 feet with ore developed in nine of them. This company operates two shafts at the level of 112 and 118 feet and is cutting an ore face twenty by thirty feet on dirt which runs from five to twenty-five per cent zinc ore. The ground is sufficiently hard that the use of timbers is unnecessary for the support of the drifts. The ore is of a high grade and assays sixty per cent. The company operates one mill, employs fourteen men and produces about ten tons per week. Their concentrating mill is supplied with a forty horse power boiler and a thirty-five horse power engine, a ten-inch crusher, two sets of rolls, twelve and fourteen-inch; one six cell self contained jig, elevators, screen, two steam hoisters and one 10x6x10 Duplex Worthington pump.

Peach Tree Mining Company.

S. J. H. White, W. C. Hosbach, Ed. Clark, Sam. Sixkiller and Mat. Ingraham, all of Joplin, Mo., compose this company and are operating four lots of the Keystone lease land at a royalty of twenty per cent. They have a shaft down forty-five feet at which level a fifteen foot face of rich lead dirt has developed.

C. M. Gregory & Company.

This company is composed of C. M. Gregory and W. H. Dunlap of Cottonwood Falls, Kansas, with Mr. Dunlap as manager. They operate four lots of the Keystone lease at a royalty of twenty per cent on zinc and twenty-five per cent on lead ore and have three shafts sunk ranging in depth from 98 to 122 feet with ore developed in each of them. The dirt hoisted from this mine is very rich and is said to run twenty-five per cent zinc. The ore occurs in hard ground where drifts fifteen by thirty feet are cut. The company employs twenty men and makes a weekly production of twenty tons. The improvements here consist of a steam hoister, five hand jigs and one two-inch discharge Gardner pump. The company is contemplating the erection of a concentrating plant.

ALIX CONSOLIDATED MINING COMPANY.

This company is incorporated under the laws of Missouri with R. Bothwell, president, and C. Shouse, of Joplin, Mo., as manager. The company has a lease on twenty acres of land owned by Henry Digby

and pays a royalty on all minerals mined of twenty per cent. There are four shafts sunk, ranging in depth from fifty-five to 100 feet, with ore developed in each of them, but the present working level is at ninety feet below the surface. The ore occurs in hard ground which will run about four per cent zinc. They have twenty-two men employed and produce about twenty tons per week. They operate a concentrating plant, equipped with one 100 horse power boiler and a fifty horse power engine, two fourteen-inch crushers, two sets of rolls, three elevators, one screen, one steam hoister, steam jigs, with a four cell rougher and an eight cell cleaner, and one 7 1-2x5x6 Worthington pump.

STUCKEY MINING COMPANY.

This lease contains seventy-two acres of mineral land situated about five miles northwest of Joplin at the village of Belleville and is the property of C. Stuckey who pays to J. S. Wright, land owner, a royalty of ten per cent and charges the operators twenty per cent. There have been about twenty shafts sunk ranging in depth from forty to eighty feet with fifteen of them showing ore. The land carries lead and zinc ore which are found at various depths from twenty-five to eighty feet, the depth of the deepest shaft. Ore has been developed at the depth of 140 feet which demonstrates the fact that a lower run exists. The ground is open and requires timbers for the support of the drifts. Two new concentrating mills have just been completed on the lease from which good productions are expected. Below we mention those operating on the land.

Ashland Wilkes.

This company is composed of Adam Scott, Gov. Leedy and Messrs. Quarles and Twerly. They control six lots of the Stuckey lease and have three shafts to an average depth of sixty feet with ore developed in each shaft in open ground. The ore is free and is easily milled. The company gives employment to about twenty men and make an average production of about forty tons of zinc ore per week. Their concentrating mill which is new and complete, is equipped with one 100 horse power boiler, one seventy-five horse power engine, two twelve-inch crushers, two sets of rolls, sixteen and twenty-four-inch; three elevators, one revolving screen, two steam hoisters, steam jigs with a five cell rougher and a six cell cleaner and two steam pumps. They pay a royalty of twenty per cent and the mines are under the management of Adam Scott, of Joplin, Mo.

Jenny Lind.

The Jenny Lind Company is composed of F. E. Chapman, of Ohio; Mr. Summerfield, of Kansas, and others. Their lease covers eight lots of the Stuckey lease on which four shafts have been sunk to an average depth of sixty feet with deposits of ore developed in each shaft. A drill hole recently put down showed a face of ore of thirty feet. The ore occurs in open ground which requires timbering for the support of the drifts which are cut about ten feet wide. A new mill has just been erected on these lots ready for operation and will doubtless make good productions of zinc ore. The plant is supplied with two sixty horse power boilers, two seventy-five horse power and one twenty horse power engines, one double twelve-inch crusher, two sets of rolls, sixteen and twenty-four-inch; elevators, screen, five and six cell steam jigs, two steam hoisters, one three-inch steam and one eight-inch lift pump. The mines are managed by F. E. Chapman.

Big Four.

The members of this company are Landis Bros and Mr. Arnold, of Chicago, who recently purchased a lease on nine lots of the Stuckey lease which are subject to a royalty of twenty per cent on all minerals mined. They have five shafts to an average depth of sixty feet in open ground with a twelve foot face of lead and zinc ore developed. The mine is new but the ore has been sufficiently developed to warrant the erection of a concentrating plant which will be done at once under the supervision of Frank Landis, the mine manager.

American Zinc, Lead and Smelting Co. Co.

This is one of our large and progressive new companies. From what we learn, it will have added largely to present holdings before our report is published; the property reported on at this time embraces 200 acres of mining land located in sections 6 and 7, range 33, township 27. The equipment consists of 4 concentrating plants, 2 hand jig plants, 8 steam hoisters, 16 horse hoisters, 4 crushers, 4 steam jigs and 2 hand jigs. There were 15 shafts of an average depth of 75 feet operated during the year, producing 85½ tons of lead, and 5,074 tons of zinc ore. Mr. E. P. Brown, is superintendent of the company, with postoffice address, Box 17, Joplin, Mo. This company has also secured the property formerly belonging to the Missouri Central Mining Company, on which there are 7 shafts of an average depth of 70 feet, 2 concentrating plants, 6 hand jig plants, 4 boilers,

3 steam pumps, 8 steam hoisters, 2 horse hoisters, 2 crushers, 2 steam jigs and 5 hand jigs.

SHORT CREEK MINING CO.

This company has a lease on 70 acres of land, 30 of which are in section 7, range 33, township 27, and the remainder in section 12, range 34, township 27. This land is owned by Connor & Porter, and is one mile north of Jackson Station on the Frisco R. R. During the year, 18 shafts, running in depth from 60 to 100 feet, were operated and produced 4,465 tons of zinc ore, and $324\frac{1}{2}$ tons of lead ore, an increase over the former year of 825 tons of zinc and 64 tons of lead ore, and an increase in the money value of the product of \$36,204. The equipment may be seen by referring to the table on Jasper County.

BADGER STATE MINING CO.

The members of this company are Hugh McIndoe, F. M. Wilson, E. A. Benson and Wm. H. Chew, with Mr. McIndoe as general manager. The 50 acres operated by this company are located in section 7, range 33 and township 27. This is a new piece of ground and its first turn in was made May 5, 1899. The capital invested amounts to \$20,000. At present but one shaft, 90 feet in depth, is operated. The plant embraces, steam boiler, steam pump, steam hoister, two horse hoisters, crusher, two steam jigs and a concentrating plant of 100 tons capacity.

MASSACHUSETTS LEAD AND ZINC COMPANY.

This company took possession of this property June 1st, 1899, which embraces 165 acres, located in sections 24 and 25, range 32, township 29. The mine on this property, known as the "Hayseed," was not worked for some months during our fiscal year, producing 323 tons of zinc ore, but, with the added improvements, we look for good results from this property under its present management.

ISHPURRING MINING CO.

Mr. C. H. Hall, of Chicago, is president; E. R. Hall, of Chicago, secretary, and Joseph Story, superintendent. The company controls

390 acres of land, located in sections 7, 8, 17 and 20, range 33, township 28. The capital stock of the company is \$10,000. The work of the past year has been confined to sinking shafts, installing machinery and placing of other improvements. A small amount of both lead and zinc was produced in the sinking of shafts.

Holden Bros. Mining Co.

This company owns 40 acres in section 13, range 34, township 28. The land is leased to small operators and at present the equipment consists of 2 hand jig plants, 2 lift pumps, 2 steam hoisters, 3 horse hoisters and 7 hand jigs.

IOWA CONSOLIDATED MINING CO.

The company owns 40 acres of land in section 12, range 34, Galena township. The property was purchased August 1st, 1898, and for the fractional year produced 398 tons of zinc and 65½ tons of lead ore. One shaft, 80 feet in depth, was operated. The plant consists of 1 concentrating plant, 2 steam boilers, 1 steam pump, 2 steam hoisters, 1 horse hoister, 1 crusher.

COMPANIES ORGANIZED BY MESSRS. COLLEY & COMPANY, OF BOSTON.

The Boston-Providence Zinc Company, owns the fee to the eighty acres at Duenweg, formerly known as the "Norton" tract. This company has a capital stock of \$300,000, divided into 30,000 shares of the par value of \$10 each. \$150,000 of this stock is preferred, six per cent non-cumulative, while \$150,000 of this stock is common stock. The common stock was given as a bonus to the purchasers of the preferred stock, so that the actual investment of the public amounts to \$150,000. The property owned by this company is leased to the Russell-Irwin Zinc Company, at a royalty of fifteen per cent.

The Russell-Irwin Zinc Company has a capital stock of \$250,000, divided into 25,000 shares of the par value of \$10 each. This company operates the land owned by the Boston-Providence Zinc Company, at Duenweg. The average weekly turn-in is given as 150 tons.

The Boston-Duenweg Zinc Company has a capital stock of \$400,000, divided into 40,000 shares of the par value of \$10 each. This

company owns and operates the tract of land at Duenweg, formerly known as the "Duenweg Mining Company." The mines on this tract are all sub-leased at a royalty of twenty-five per cent. The average weekly turn-in is reported to be 250 tons.

The Missouri Zinc Fields Company has a capital stock of \$1,600,000, divided into 64,000 shares of the par value of \$25 each. Of this, \$400,000 is preferred stock, bearing eight per cent interest, while the remaining \$1,200,000 is common stock. The purchasers of the \$400,000 preferred stock received an equal amount of common stock as a bonus. The remaining \$800,000 worth of common stock went to the promoters. This company operates 440 acres of land at Carterville, formerly known as the "Tracy" tract. The purchase embraces both the fee and the lease held by the Chatham Mining Company. This company's properties are leased at a royalty of twenty-two and one-half per cent on jack and thirty-seven and one-half per cent on lead. The average weekly turn-in is reported as 250 tons.

The Boston-Aurora Zinc Company has a capital stock of \$3,200,000, divided into 128,000 shares of the par value of \$25 each. Of this, \$800,000 is preferred stock, while \$2,400,000 is common stock. The preferred stock is eight per cent cumulative. The purchasers of the preferred stock received an equal amount of common stock as a bonus. The remaining common stock went to expenses and profits of promotion. This company operates 528 acres of land at Aurora, eighty acres of which were formerly known as the "Minor & Rogers" tract, while the remaining 458 acres was formerly known as the "Flournoy" land. The purchase in this case embraced not only the fee, but all leases, with the exception of two non-productive leases, known as the "Smith" and "Argyle" leases. The average weekly turn-in is 300 tons.

The Providence Get There Zinc Company has a capital stock of \$225,000, divided into 22,500 shares of the par value of \$10 each. This company owns the fee to the forty acres formerly known as the "Get There" property, at Prosperity, Missouri. This land is leased to the Boston-Get There Zinc Company at a royalty of eight and three-fourths per cent.

The Boston-Get There Zinc Company has a capital stock of \$250,000, divided into 25,000 shares, of the par value of \$10 each. This company operates the forty acres owned by the Providence-Jasper Zinc Company, for which it pays a royalty of eight and three-fourths per cent. The mines controlled by this company are all sub-leased at a royalty of twenty-two and one-half per cent. The average weekly turn-in is about 200 tons.

The Boston-Sunflower Zinc Company has a capital stock of \$150,000, divided into 15,000 shares of the value of \$10 each. This company is a lessee of the ground of the Boston-Duenweg Zinc Company, and produces as high as 100 tons of ore per week. This company pays a royalty of twenty-five per cent to the Boston-Duenweg Zinc Company. It has a lease on four lots, which runs for a period of six years.

The net earnings of the foregoing companies are approximated by their consulting engineer, as follows:

Boston-Providence Zinc Company, \$25,000 per annum.

Russell-Irwin Zinc Company, \$50,000 per annum.

Boston-Duenweg Zinc Company, \$100,000 per annum.

Missouri Zinc Fields Company, \$100,000 per annum.

Boston-Aurora Zinc Company, \$300,000 per annum.

Providence-Jasper Zinc Company, \$30,000 per annum.

Boston-Get There Zinc Company, \$45,000 per annum.

Boston-Sunflower Zinc Company, \$75,000 per annum.

All of the properties organized by Messrs. Colley & Company are under the general charge and supervision of Mr. Frank Nicholson, consulting engineer.

THE GET THERE MINING COMPANY.

The "Get There" lease which contains forty acres of land, owned by Providence-Jasper Zinc Company, in fee simple, is situated one mile southeast of Carterville and is the property of the Boston-Get There Zinc Company, incorporated under the laws of New Jersey with offices at Boston, Mass. This property is one of the principal and steady producers of the district and is very profitable to the owners. The land is sub-leased by lots to operators at a royalty of twenty-two and one-half per cent on zinc ore and thirty-three and one-third per cent on lead ore. The ground is very hard and ore is encountered at about 150 feet, the ground being worked to an averagedepth of 165 feet, air drills being necessary to break it successfully and economically. The ore is found in sheet formation, disseminated through the rock, both lead and zinc ores being produced. A splendid cap rock exists all over the lease making it possible to cut drifts of great width with perfect safety. The land was first prospected by Col. James O'Neill of Webb City, Mo. by drilling various portions of it and demonstrating the presence of ore in each drill hole. At the time Col. O'Neill began to develop this land, in 1892, it was an unpromising undertaking as the ground was extremely hard and very expensive to sink in, but by persistent effort he succeeded and opened up one of the most profitable tracts of mineral land in the district.

The following tabulated statement shows the yearly production and money value of the lease since 1893:

Year.	Lead, pounds.	Zinc, pounds.	Value.
1893.....	264,430	364,530	\$8,778 30
1894.....	328,900	150,570	6,816 24
1895.....	1,382,240	838,020	32,449 88
1896.....	4,230,550	3,278,860	91,612 63
1897.....	3,457,560	3,179,600	81,984 43
1898.....	3,555,570	4,425,140	120,003 31
1899.....	1,614,520	8,108,000	170,872 00
Totals.....	14,834,000	20,344,620	512,514 79

The following operators are doing a successful business on the "Get There" lease:

Zogg & Company.

This company is operating two lots of the "Get There" ground, a \$7,000 mill which burned down in October, 1898, causing a loss of \$5,500, as they had only \$1,500 insurance on the property. They immediately commenced the erection of a new mill which was completed early in March, 1899, and since that time they have worked their ground with great profit. The mill is modern and complete in every respect and is equipped with a 100 horse power boiler, forty horse power engine, sixteen-inch crusher, two sets of rolls, of extra large size; steam jigs with four cell rougher and five cell cleaner, screens and elevators, steam hoister and a three-inch discharge centrifugal pump which furnishes an abundance of water for reduction purposes. The new plant cost about \$6,000 and in addition to handling his own ore, Mr. Zogg also cleans the ore from the McGhee and Carman lots on a contract with the owners.

The Atlas Mining Company.

This company is incorporated under the laws of Kansas with a capital of \$50,000. The officers are J. W. Grounds, president; J. F. Witmer, vice-president; S. A. Shinkel, secretary; I. S. Stephens, treasurer, and R. F. Glenn, manager. The company is operating four lots of the "Get There" ground and its property is a very promising one. Two shafts have been sunk, both in very hard ground, requiring an air drill to break it. They are working at the 165 foot level on an excellent face of ore and produce as high as forty tons of zinc ore and \$15,000 pounds of lead per week, working from twenty-five to thirty

men. They have a high power modern plant which cost about \$10,000 and is equipped with 140 horse power boilers, fifty-five horse power engine, three sets of large rolls, sixteen-inch crusher, steam jigs with five cell rougher and six cell cleaner, screens and elevator and a six drill air compressor.

Hornish & Company.

This company operates one lot on the "Get There" ground and have developed a good run of ore at 170 feet, which is at the water level in hard ground. The machinery consists of a steam hoister and hand jigs. The ground carries both lead and zinc ore and will, without doubt, prove profitable to its owners, who are Henry Adams, G. B. Hornish and G. D. Richardson.

Phoenix Mining Company.

This company operates three lots on the "Get There" ground and the ore worked by them is found at the usual level (165 feet) on this ground. Their mine requires no timbering and has been a good producer of both lead and zinc ore. They have a complete modern plant of large capacity for handling their dirt.

The Laura S.

The Laura S. mining property is owned by T. J. Steers of Joplin, Mo., and consists of five lots numbered 4, 5, 10, 14 and 15, and is located on the Boston-Get There Zinc Company's lease. The property is situated about one mile southeast of Carterville and adjoins the Troup of mines on the east. Lots 14 and 15 are located on the Boston Get There ground and are subject to a royalty of twenty-two and one-half per cent on zinc and thirty-three and one-half per cent on lead ore and the lease on these lots has about nine years to run. Numbers 4, 5 and 10 are located on the Troup Mining Company's land which adjoins the "Get There." The lease on these lots has about five years to run and is subject to a royalty of twenty per cent on zinc and thirty-three and one-third per cent on lead ore and an additional charge of \$1 per ton for pump rent. The shaft from which the ore is hoisted is located on lot 14 on the "Get There" land and has been sunk to a depth of 155 feet. The ore occurs in sheet formation, in hard flint and the face is from twelve to twenty feet in height and has gradually widened to a width of about 100 feet. The ground has been worked in a most workman-like manner and pillars have been left for the support of the roof which on account of its solidity enables the ground men to cut wide drifts with absolute safety. The ore is very evenly

distributed over the entire face and the dirt will average about ten per cent zinc. The zinc ore is all of a high grade and continues in the sides of the drifts which shows that the full extent of the ore run has not yet been developed in spite of the already large output from this mine. The general formation and the occurrences of the ore bodies are such that we are of the opinion that it would be difficult to predict the end of profitable mining at the Laura S.

The improvements on this property consist of a complete concentrating plant erected at a cost of \$9,000 and is modern and complete in every particular. It is equipped with two seventy horse power boilers, a forty-five horse power engine, a Sampson steam hoister, steam jigs with a four cell rougher and five cell cleaner, one fourteen-inch crusher, three pairs of rolls, twenty, twenty-four and twelve-inch, revolving screen and elevators. The ground is broken with air drills run by a ninety horse power eight drill Ingersoll air compressor. The ground is drained by a five-inch suction pump. The plant has a daily capacity of 100 tons and handles from 250 to 300 tubs of 700 pounds each ten hours.

BOSTON DUENWEG MINING COMPANY.

This company owns in fee simple seventy acres of land situated about seven miles southeast of Webb City, on which a part of the busy little town of Duenweg is situated. The company is composed of eastern capitalists who purchased the land of the Duenweg Mining Company, a few months ago. The ore on this land was first developed by Grant P. Ashcraft of Webb City, Mo., in 1894, but the land and mine was purchased shortly thereafter by the Duenweg Mining Company, when J. Allan Hardy, of Webb City, assumed the management. This land joins the famous Grounds & Irwin mines on the north and has proven a magnificent producer of both lead and zinc ores. Some of the most wonderful producing mines in the state are situated on this tract and the turn-in from the ground often reaches 300,000 to 400,000 pounds of zinc and 30,000 to 40,000 pounds of lead per week. The ore bodies are encountered at from 90 to 165 feet in very soft ground which requires heavy timbering to hold the drifts. In addition to a concentrating mill, the company operates a custom mill for the benefit of its lessees who have no mills of their own. There are seven producing shafts on this tract and four concentrating mills besides several prospect shafts going down. The ground is easily drained, the operators having only sufficient water for operating purposes. Two lift pumps and one Snow pump are used to drain the

ground and provide the water to run the machinery. It is claimed there is a big body of ore lying in "sheet" or "blanket" formation below the upper runs. Following are some of the operators on the land:

The Newsboy Mining Company.

The Newsboy is one of the most prosperous of the Duenweg mines and is owned by Josiah Bennett and H. U. Dale, of Joplin, Mo., J. L. Bennett and J. C. Carmean, of Channute, Kansas, and P. H. Carmean, of Duenweg. This company operates three lots of the Boston-Duenweg ground and have two shafts down 120 and 135 feet, respectively. The ground is soft and requires heavy timbering to support the drifts. There is about an equal amount of lead and zinc produced by this ground and the output of this mine has been very satisfactory and gratifying to the owners. The mine has the record of producing in one week, 182,000 pounds of lead and 80,000 pounds of zinc ore and the total production for the twelve months ending May 1, 1899, was about 4,000,000 pounds of zinc and 4,000,000 pounds of lead ore. The company recently erected a new and modern concentrating plant at a cost of about \$6,000, supplied with two boilers of forty-five horse power each, sixty-five horse power engine, and two engines of twenty-five horse power each, used for hoisting and pumping purposes, twelve-inch crusher, three sets of rolls, twelve, eighteen and twenty-two-inch; steam jigs with five cell rougher and six cell cleaner, two steam hoisters, elevators, screens, one Dean and one Snow steam pump, blacksmith shops, office and scales.

Sunflower Mining Company.

This mine is now operated by W. E. Colley as trustee for the eastern owners. There are two shafts down to a depth of 145 feet with a thirty foot face of ore in each and dirt is being hoisted from both. The ground is soft at the upper working level but the lower ground is hard. They employ forty men working double shifts and the average weekly output when working full time is about one hundred tons of zinc ore. The mill is equipped with eighty horse power boiler, forty horse power engine, fourteen-inch crusher, two sets twenty-inch rolls, steam jigs with five cell rougher and six cell cleaner, elevators, screens, Freeman & Schellenbach hoisters, and two-inch Snow steam pump.

Baptist Mining Company.

The Baptist Mining Company is composed of Albert, John and Martin Carrick, who are operating one lot of the Boston-Duenweg

ground and have a shaft down 140 feet with a thirty-five foot face of ore. They employ forty men, work double shifts and their average weekly output is sixty to seventy tons of zinc ore and 20,000 to 30,000 pounds of lead. They have a complete mill equipped with eighty horse power boiler, forty horse power engine, fourteen-inch crusher, three sets of twenty-inch rolls, steam jigs with five cell rougher and six cell cleaner, elevators, screens and Freeman hoister. Albert Carrick is superintendent of the ground.

Keystone Mining Company.

The Keystone Mining Company is composed of W. H. Landreth, of Joplin, and James Luke and Byron Ash, of Carthage, and a Mr. Snodgrass. W. H. Landreth is superintendent. They employ fourteen men, single shifts, and have a shaft down 140 feet with a twenty-five foot face of ore. They have a Freeman steam hoister and a two-inch discharge Snow pump. There is no mill on their lot and they have their dirt handled on the custom mill of the company. Their weekly output is about forty tons of jack and a small amount of lead.

Jack Pot Mining Company.

The Jack Pot Mining Company is composed of J. G. Boyd and P. H. Carmen, the former acting as superintendent. They operate one lot (the old Allan Hardy lot) and have a shaft down 160 feet with a forty foot face of ore. They employ ten men per shift and make an average weekly output of thirty tons. The only steam machinery they have is a Wormer hoister and their ore is milled on the custom plant of the company.

Hoo-Hoo Mining Company.

The Hoo-Hoo Mining Company is composed of Amos D. Hatton and O. J. Raymond, of Webb City, who operate two lots of the Boston-Duenweg ground. They have a shaft down 142 feet with a forty-five foot face of ore in soft ground requiring heavy timbering. Oscar Bay is the superintendent and ten men are employed, single shifts. They raise the dirt with a Wormer steam hoister and clean the ore on the custom mill of the company. Their average weekly turn-in is about thirty tons of jack and no lead.

Custom Mill of Boston-Duenweg Company.

The mill is maintained for the use of the operators and prospectors on the company's ground who have no steam milling machinery. The equipment consists of eighty horse power boiler, thirty

horse power engine, sixteen-inch crusher, two sets twenty-inch rolls, steam jig with four cell rougher and five cell cleaner, elevators, screens, etc., and the plant has a capacity of 100 tons of rough dirt per shift.

Pumping Station of Boston-Duenweg Company.

The pumping station of the company is equipped with boilers of sixty and twenty horse power and two eleven-inch Cornish lift pumps drain the ground thoroughly to a depth of 160 feet. There is also a Wormer steam hoister in the pump shaft.

RUSSELL-IRWIN MINING COMPANY.

This tract of land contains eighty acres and was until recently known as the Grounds & Irwin lease. It is located on the north half of the northwest quarter of section 10, township 27, range 32 and was until a short time ago the property of J. W. Grounds and T. K. Irwin, of Carthage, Mo. The land was owned in fee simple by G. W. Norton, but both the fee and lease are now the property of the Russell-Irwin Mining Company. The property adjoins the Boston-Duenweg on the south. The operations on this tract date back to 1895, when prospecting was first commenced and since that time the production of this ground has been enormous, reaching the great total of forty millions of pounds of zinc ore and three million pounds of lead. The town of Duenweg is partly situated on this tract and a large and industrious mining population find steady employment at good wages. The development of this great tract of mineral bearing land is due to the energy of Messrs. Grounds & Irwin, who had unlimited faith in the ground and who spent a large amount of money in opening it up to miners. The first developments were at the east end where the ground is open requiring heavy timbering to hold the drifts. The ore is very rich and the prospect work was continued toward the west where the ground is harder and the ore was found disseminated in sheet formation. In all there are about twenty shafts on this ground ranging in depth from 30 to 140 feet. From the developments already made it would appear that almost the entire eighty acres is underlaid with ore. The greater part of the output has been made by the company, but there are a number of individual operators who have worked the ground with splendid success. The Missouri Pacific and the Kansas City, Ft. Scott & Memphis Railways both have switches direct to the ground and an electric belt line is now contemplated which will place Duenweg in direct connection with Joplin. These mines give employment

to about 180 men. The pumping system is very efficient and is equipped with Worthington, Snow and Cook steam pumps of sufficient capacity to thoroughly drain the ground. The company operates three large custom concentrating plants for the convenience of the operators on the ground and these mills are all equipped with large boilers, engines, crushers, rolls, screens, elevators, steam jigs, and all necessary machinery for reduction purposes. Following are some of the individual operators on the ground:

The East Mill.

This mill is situated on one of the five lots operated by the Russell-Irwin Company. There are five shafts down on this ground ranging in depth from 105 to 120 feet, but only three are being operated at present. There are two twelve-inch Cook steam pumps in the pump shaft, but only one is needed to drain the ground, the other being kept in reserve. The mill is equipped with two boilers, eighty and forty horse power, respectively, forty horse power engine, fourteen-inch crusher, two sets twenty-inch rolls, steam jigs with five cell rougher and six cell cleaner, screens, elevator and three steam hoisters. Forty men are employed and the average weekly output is about sixty tons of zinc ore and no lead.

The West Mill.

The West mill is also operated by the company and they have two working shafts down to a depth of 154 feet with a forty-five foot face of ore in each and a pump shaft down to the same level. Fifty to sixty men are employed on this ground and the average weekly output is sixty tons of zinc ore with an occasional small turn-in of lead.

There is a very complete mill equipped with 120 horse power boiler, forty horse power engine, fourteen-inch crusher with three sets of rolls, steam jigs with five cell rougher and six cell cleaner, elevators, screens and Freeman and Schellenbach hoisters. The pumping plant consists of a Worthington five-inch discharge and a nine-inch Cornish lift pump with a thirty horse power boiler geared direct.

Easter Mining Company.

The Easter Mining Company is composed of Valentine, Anderson & McKee, all of Joplin, Mo. They operate two lots of the Russell-Irwin ground and have a shaft down 140 feet with a twenty foot face of ore. The ground has just been opened (July, 1899) and there are fifteen men employed with Boss McKee as superintendent. The mill is a new one with eighty horse power boiler, forty horse power engine,

fourteen-inch crusher, three sets of rolls and one set pony rolls, steam jigs, screens, elevator, Freeman hoister and twelve-inch Cook pump.

Lown & Raymond.

This company is composed of Martin Lown and O. J. Raymond, with the former as superintendent. They have three lots with a shaft down 140 feet with a thirty foot face of ore and are sinking a new prospect shaft. They employ fifteen men, single shifts, and their average weekly output is sixty tons of zinc ore and no lead. They have a complete mill costing about \$5,000, equipped with eighty horse power boiler, forty horse power engine, fourteen-inch crusher, two sets of rolls, steam jigs with five cell rougher and six cell cleaner, elevators, screens and Freeman hoister.

CROWN POINT MINING COMPANY.

The lease of the Crown Point Mining Company contains ninety-five acres and is situated just east of the Boston-Duenweg and Russell-Irwin properties. It is the property of W. G. Davidson and J. A. Bowman, of Webb City, Mo. Prospecting was first commenced on this ground in the spring of 1897, and by early fall, ore was being produced and marketed. Both lead and zinc ore is found, the lead at very shallow depths, it being encountered at some points on the ground only eighteen feet from the surface. The zinc ore is encountered at greater depths. The ground is well located for mineral and the lease produced up to the present time about two million pounds of zinc and nearly the same amount of lead. The land owners receive a royalty of ten per cent on the first lease while the sub-lessees pay a royalty of twenty-two and one-half per cent on zinc and on a \$28 basis for lead. The improvements of the company consist of a pumping station equipped with two nine-inch lift pumps, three boilers, thirty-five horse power engine, steam hoister, shop, office and scales. More than 100 shafts have been sunk on this ground, ranging in depth from twenty to 140 feet, but most of them are very shallow, being sunk for lead. Zinc ore is encountered at from 70 to 140 feet and from present indications the land will develop into one of the largest producers in the district. The land was until recently owned by W. H. Phelps of Carthage, Mo., W. M. Robinson, Jefferson City, and J. W. Aylor, of Webb City.

Apple & Wilson.

This firm has a lease of two lots of the Crown Point Mining Company's land and have a shaft down 125 feet, but are working at present

on lead at from twenty to thirty feet. Their machinery consists of a Marsh ten-inch steam pump and Schellenbach hoister. They employ eight men and make from 10,000 to 12,000 pounds of lead per week. Ed. Apple is superintendent.

Blue Ribbon Mining Company.

The Blue Ribbon Mining Company is the property of McClanahan, Brundage & Blake. They use a horse hoister, employ four men and make about fifteen tons of silicate a week working at a depth of twenty-five feet. All the silicate on this lease is cleaned on a contract at a stated price per ton, the sub-lessees simply hoisting the ore.

Van Hoose & Hare.

Van Hoose & Hare have a shaft down 100 feet in good jack, but they are unable to work at this level on account of strong water and are operating their two lots for shallow lead. They use a horse hoister, work ten men and make from 2,000 to 3,000 lead a week, besides their turn-in of silicate.

Jones & Gunsenhauser.

Jones & Gunsenhauser are working one lot under the name of the "Queen Bee" Mining Company. They are working at the seventy foot level and make from eight to ten tons of silicate per week, working three men and raising the ore with a horse hoister.

Little Joe Mining Company.

The Little Joe is the property of W. H. Decker, J. A. Bowman and J. M. Burgner, of Webb City, and J. W. Dawson, of Duenweg, Mo. They are operating two lots of the Crown Point Mining Company's land and five shafts have been sunk on their lease ranging from thirty to seventy-five feet in depth. Lead ore has been developed in every shaft put down and the average production weekly is about 10,000 pounds, but it has run up as high as 30,000 pounds. The company pays the regular royalty of twenty-two and one-half per cent on zinc and on the \$28 basis on lead, the dirt is raised by a horse hoister and cleaned on hand jigs.

The Hobo Mining Company.

The company is composed of Ed. U. Apple, of Joplin, Mo., and W. M. Wilson, of Webb City, Mo., who are operating two lots of the Crown Point land and are taking out lead at the eighteen-foot level

from one shaft while a good face of zinc ore is being opened up in the other shaft at the 120 foot level. A horse hoister and hand jigs are used for the lead working, while a steam hoister is in use at the deep shaft. They make about 12,000 pounds of lead per week with four men employed. E. U. Apple is the manager of the property.

Moon's Dream Mining Company.

The members of this company are R. S. Moon, W. G. Davidson and J. A. Bowman, of Webb City. They are operating four lots of the Crown Point land and from twenty to thirty shafts have been sunk on the six lots held by this company, ranging in depth from twenty-five to 100 feet. Three drill holes have been put down on this property which developed good bodies of zinc ore at 115 feet. Lead ore is found at from twenty-five to forty feet and from this level there has been a large output. The weekly production runs from 10,000 to 40,000 pounds of lead and about twenty tons of silicate. The lead ore is mined on the \$28 basis while the usual royalty of twenty-two and one-half per cent is paid on zinc ore. Horse hoisters are used to raise the ore which is cleaned on hand jigs. R. S. Moon, of Webb City, is the manager of the property.

NEEDMORE LEASE.

This mining lease contains ten acres and is situated just west of the Grounds & Irwin mines at Duenweg. The land was recently sold by W. H. Phelps to eastern parties, but is being operated by C. H. Phelps, J. C. A. Miller and J. P. Hennesey, all of St. Louis, who own the lease on the land. The ground was first prospected by steam drill which demonstrated the presence of the ore after which a shaft was sunk which developed the ore body at about 140 feet. The ground is new, but the indications are favorable for the presence of an extensive body of ore and the land will doubtless prove profitable to the parties interested. The machinery in use at present, consists of two ten-inch lift pumps, a 150 horse power boiler, a three-inch Snow duplex pump and a steam hoister. The business of the company is in the hands of T. G. Hood, of Carthage, Mo.

SADTLER LEAD & ZINC COMPANY.

The Sadtler Company is composed of S. P. Sadtler, Philadelphia, Pa., president; Charles M. Dodson, Bethlehem, Pa., vice-president; A. M. Cullagh, Joplin, Mo., manager, with J. A. Strong, Webb City, Mo., as superintendent. The company owns in fee simple, a tract of 220

acres of mineral land one-half mile southwest of the Duenweg camp. Prospecting was commenced with steam drills in 1895 and was continued up to the present time, there has been nearly five thousand feet of drilling done and it is said that lead or zinc ore was struck in a majority of the holes put down, and in some of them both lead and zinc ore was found in large quantities. This should certainly be a good tract of mineral land as it is well located with reference to other big producing mines and will no doubt eventually add very largely to the output of the district in which it is situated. When the land was actively worked the production was reasonably fair but not as great as the appearance of the land and general surroundings indicate might be expected. Better results are confidently looked for in the future. The company operates two large pumps to drain the ground for the operators and has a complete concentrating plant of large capacity, equipped with two eighty horse power boilers, two engines of forty and twenty-five horse power, sixteen-inch crusher with four cell rougher and five cell cleaner, two sets of rolls, elevator and screens, steam hoister and a four-inch centrifugal pump which supplies the mill with water. There are about ten shafts down on the ground, some of them to the 160 foot level at which depth a good deposit of zinc ore has been developed and where it is claimed a sheet formation of zinc exists.

WEBB CITY DISTRICT.

CENTRE CREEK MINING COMPANY.

No mining review of the Webb City district would be complete without mention of the Centre Creek Mining Company, yet the great mineral producing tract of the company has been noticed so extensively in previous reports that there is little to add that is new. The company is incorporated with a capital of \$1,000,000 and the officers are J. C. Stewart, president and general manager; F. M. Hammett, vice-president; W. C. Stewart, secretary and treasurer. The company owns a tract of land containing 160 acres within the city limits of Webb City, a forty acre tract north of Carterville adjoining the 160 acre tract and ten acres within the southern limits of Webb City. It was on the company's 160 acre tract that the first mineral in the now famous Webb City district was struck. In the early days of mining, lead was the only ore possessing a commercial value, zinc ore being thrown on the dumps as waste, but it was only a few years until the value of zinc ore was discovered and deeper mining was commenced and from this time on commenced the development of one of

the greatest mineral districts in the country. After the organization of the company the land was platted into lots two hundred feet square which were leased to operators at a royalty of twenty-two and one-half per cent on zinc ore and the royalty on lead was fixed on the basis of St. Louis prices. The company maintains a splendid pumping station including a system of string pumps. There are five pump shafts on the property, sunk to a depth of 155 feet. Steam pumps are operated in two of the shafts and in the others they have force or column pumps, driven from the central power station, connected by long strings of timber and working in unison. The company will sink its pump shaft deeper so that the ground may be drained to the apparently inexhaustible ore bodies which are known to exist beneath the present workings. The deposits of ore on this ground appear limitless in quantity and have been developed from about forty feet from the surface to the depth of 150 feet which is about the water level on this ground and in almost every instance where ore has been developed to this level, the bottom of the drifts are still very rich in mineral which will be made available by deeper drainage. That this property is wonderfully productive and remunerative to the Centre Creek Company, is shown by the appended table of the output with the money value for the past thirteen years:

Brief mention of some of the operators on the ground follows:

Year.	Lead, pounds.	Zinc, pounds.	Value.
1887.....	2,236,720	30,209,100	\$356,045 25
1888.....	1,902,520	27,477,520	370,531 69
1889.....	2,805,580	37,969,520	526,511 13
1890.....	2,593,970	44,685,090	593,475 40
1891.....	1,760,120	33,539,950	403,798 74
1892.....	1,910,880	23,547,880	296,002 84
1893.....	1,223,720	19,486,330	204,694 37
1894.....	1,655,610	22,251,620	210,324 87
1895.....	822,650	18,848,750	191,408 46
1896.....	590,960	10,423,490	105,273 55
1897.....	756,710	10,530,500	106,750 61
1898.....	836,000	11,902,000	146,915 00
1899.....	994,680	12,698,000	228,896 31
Totals.....	20,100,320	303,839,750	3,740,629 22

Pumping Station.

The Centre Creek Mining Company has one of the most complete pumping plants to be found in the Southwest Missouri mineral dis-

trict. This plant was erected ready for operation at a cost of about \$45,000 and is equipped with four forty-six horse power boilers, two engines, twenty by forty-two and twenty-four by forty-two, making about 400 horse power. The company maintains a number of steam pumps on its land which add very materially to the efficiency of its drainage system, they have also erected a large and very complete concentrating plant, equipped with all modern machinery at a cost of about \$5,000.

The Beaseley Mine.

What is known as the Beaseley mine is now operated by Mrs. Nancy I. Beaseley, of Carterville, Mo., and is one of the oldest mines on the Centre Creek ground, having been worked almost continuously since 1877. This mine has been a most remarkable producer, in fact there is probably no mine in the district with a record for continuous production for so long a period. Considerably more than half a million dollars worth of ore has been taken out of this mine and there is an apparently inexhaustible quantity of ore still remaining in the ground. This mine contains the largest single drift of any mine in the district. The drift is one hundred feet wide, seventy to eighty feet high and over two hundred feet in length in a circular form without any timbering for its support. This great space is held intact by a solid limestone cap rock which like the drift is remarkable for its great width, length and thickness. There are three lots controlled by Mrs. Beaseley on which there are three shafts sunk to a depth of from 135 to 140 feet, all the lots being worked to the water level with ore faces ranging from fifteen to thirty feet, most of which is zinc ore, the ground producing but very little lead. The royalty is twenty-two and one-half per cent on zinc and lead is mined on the \$28 basis, St. Louis quotations. There is a concentrating mill on this property erected at a cost of about \$3,000 and equipped with eighty horse power boiler, twenty-five horse power engine, fourteen-inch crusher, one set of eighteen-inch rolls, steam jigs with three cell rougher and five cell cleaner, screens and elevators, two of the latest improved Freeman steam hoisters. There are fourteen ground men and seven top men employed and the superintendent is Green W. Beaseley of Carterville.

Smith & Holcomb.

This company is composed of Webb City gentlemen who operate four lots of the Centre Creek ground, numbers 42, 81, 87, and 88. They commenced work in 1892 by sinking a shaft on lot 42 to a depth of 120 feet and went into a rich body of zinc ore at seventy-five feet

which continued to the bottom of the shaft. Five drifts have been cut on the four lots varying in length from 200 to 251 feet and forty feet wide by forty feet high, all of which appear to be on top of the ore and supported by an excellent cap rock, no timbering being required. This ground has been worked almost continuously for over seven years and there is apparently many years work still ahead as the water is being lowered to enable operators to get into the lower ground. Twenty men are employed and the production reaches twenty to twenty-five tons per week. The improvements consist of a concentrating plant, equipped with forty-five horse power boiler, sixty horse power engine, twelve-inch crusher, two sets of nineteen-inch rolls, steam hoister, steam jigs with three cell rougher and four cell cleaner, screens and elevators and six-inch steam pump. B. Smith, of Webb City, is the manager of the property.

Brewer, Brown & Company.

Brewer, Brown & Company operate four lots of the Centre Creek ground and have been making very regular productions of both lead and zinc for several months, their output ranging from twenty-five tons of zinc and about 3,000 pounds of lead to thirty tons of zinc and 5,000 pounds of lead per week. On one of these lots the Centre Creek Company have a pump shaft down 150 feet, which is expected to drain this part of the ground, if not it will be sunk deeper. The other shafts are down to a depth of 145 feet and at this level a good run of ore is being worked. The ore bodies on these lots are encountered at the 100 foot level, but the bottom of the drifts are reported rich in ore. A face of ore is being worked about forty feet in height, two drifts having been cut a distance of about 150 feet. The lots are sub-leased of Chas. A. Parker, who did the original prospecting and who had such faith in the future of the ground that he did not cease work during the general period of depression and the extreme low prices existing from 1893 to 1896. His patience, good judgment and perseverance have been rewarded by uncovering these large and rich deposits of ore. The ground is hard, requiring no timbering and the ore is of unvarying high grade. Fifteen men are employed at the mine and a complete concentrating plant is in operation to handle the dirt. The mill is equipped with a forty and a twelve horse power boiler, forty horse power engine, fifteen-inch crusher and three sets of rolls, steam jigs with four cell rougher and five cell cleaner, elevators, revolving screens, steam hoister and centrifugal pump. There are few mines in the district with a brighter future and under the management of Ben.

Brewer, the production will certainly be maintained at a standard satisfactory to all concerned.

Magruder's Custom Mill.

W. E. Magruder moved his custom mill to the Centre Creek ground in March, 1899. The plant has a capacity of 125 tons per day and five men are employed. The equipment consists of fifty horse power boiler, thirty-five horse power engine, fourteen-inch crusher, three sets of twenty-four-inch rolls, steam jigs with four cell rougher and six cell cleaner, elevators, screens, etc. The plant was purchased of Springs & Williams.

Moody & Harlan.

Moody & Harlan have a lease on four lots of the Centre Creek ground with shafts down on all of them and a good ore face in every shaft. They are working at the 100 foot level and employ twelve men, their average turn-in being fifteen tons of jack per week. They have a complete mill equipped with forty horse power boiler, thirty horse power engine, two sets twenty-six-inch rolls, twelve-inch crusher, steam jigs with four cell rougher and five cell cleaner, elevators, screens, and Freeman steam hoister. H. Moody, of Carterville, is superintendent.

Coyne & Dermott.

This firm is composed of Thomas Coyne and John Dermott, who operate two lots of the Centre Creek ground, east of the Pacific tracks. They have three shafts, all in ore at depths ranging from 110 to 135 feet and have five drifts with a forty foot ore face in each drift. They employ twenty-three men, single shifts, and make an average weekly output of 40,000 to 70,000 pounds of jack and 5,000 pounds of lead. They pay a royalty of twenty-two and one-half per cent on jack and on the \$25 basis on lead and hoist only from one shaft. They have without exception the best mill of its size in the country, which was completed and started up in February, 1899. The mill is equipped with eighty-five horse power boiler, fifty horse power engine, fourteen-inch crusher, three sets of rolls, six foot revolving screen, Cooley self contained jigs with four cell rougher and five cell cleaner, elevators and Freeman hoister. Everything about the mill is neatness itself and economy of space and power seem to be the result striven for and they are certainly attained at this plant.

Maix, Ball & Company.

This is a custom mill belonging in part to the Marx estate and is under the management of the Exchange Bank, with F. J. Ball as superintendent. They employ about nine men and the capacity of the mill is seventy tons of rough stuff per day, while the average weekly output is ten to twelve tons of cleared ore. The mill is equipped with a forty horse power boiler, thirty-five horse power engine, fourteen-inch crusher, three sets of rolls, twenty-two, eighteen and twelve-inch, steam jigs, elevators, screens, etc.

Fisher & Morgan.

Charles Fisher and S. K. Morgan, of Webb City, are the members of this company and are operating lot number 22 of the Centre Creek Company's ground. They pay a royalty of twenty-two and one-half per cent on zinc ore and mine lead on the \$28 basis. They are cutting a fair sized face of ore at the 135 foot level, and have a complete concentrating mill with which they do considerable custom work beside cleaning their own ore. The plant is supplied with a forty-five horse power boiler, thirty-five horse power engine, fourteen-inch crusher and two sets of fifteen-inch rolls, steam jigs with three cell rougher and five cell cleaner, elevators, screens and steam hoister. The company gives employment to twelve or fifteen men and produce from twenty to thirty tons of zinc ore per week.

KERR, BROWNLEE & McCULLAGH MINING COMPANY.

This company is operating on a forty acre tract of land owned by Grant P. Ashcraft, of Webb City, Mo., and on a twenty acre tract owned by Alber Kelly, of New York. The property is located about one and one-half miles northwest of Webb City, being between that city and Oronogo. Prospecting was commenced on this land some years ago, and good bodies penetrated at a depth of 175 feet by drill. In all there are fifteen shafts sunk on the land down to an average depth of 173 feet at which level a number of long drifts have been cut, developing good bodies of ore. The ground is hard, no timbering being required for its support. The ore is mostly free, rendering the process of cleaning more easy. When this land was first prospected very strong water was encountered and after the prices of mineral became so low the works were shut down and remained closed until the present company took charge something over a year ago. This company is incorporated under the laws of Missouri with a paid up

capital of \$15,000 and are pushing work of development as rapidly as possible. It is expected that when the development work now under way is completed that further large bodies of ore will be disclosed and the production very materially increased. At present the output reaches about twenty tons per week. The improvements here consist of a very costly and complete concentrating plant, modernly built and equipped with boilers to the extent of 200 horse power, a ninety horse power engine, steam jigs with four cell rougher and a four cell cleaner, steam hoisters, one sixteen-inch crusher, one set or sixteen-inch rolls, elevators, screens, etc., a drill air compressor. Sufficient steam pumps have been placed to handle the water easily. On the Kelly twenty acre tract adjoining the Ashcraft on the south, the company has one of the largest shafts in the district, six by sixteen feet and sunk to a depth of 175 feet, developing a good body of ore. I am informed, the company will operate this shaft with a cage and will erect one up-to-date concentrating mill.

Funk Bowman & Company.

The members of this company are Ferdinand J. Funk, of Marion, Kansas; H. M. Bowman and Mrs. Florinda Bradford, of Webb City, Mo. The company owns in fee simple two lots of Hough & Furness's addition to Webb City. The most extensive and profitable ore bodies are developed about 190 feet below the surface, but lead is found from twenty feet down. This shaft bears the distinction of being the first on "Sucker" to show mineral and was opened by A. T. Steelman, who purchased the lots for residence property and discovered lead while sinking a well. Mr. Steelman took out about \$25,00 worth of lead and zinc ore and in 1892, sold the lots to the above company, since which time there has been mined and sold about \$24,000 worth of lead and zinc ore. While this is the oldest mine on "Sucker Flat," it is said to still contain great quantities of ore. The property is in charge of Mr. Bowman.

FREE COINAGE LEASE.

The Free Coinage lease is the property of J. W. Earles, Jeremiah Clark, Wm. Bolin, and Mrs. Wm. Braseur, of Webb City, Mo. The tract contains about 110 acres of mineral land and is leased for a term of fifteen years at a royalty of eight per cent, the lease having about eleven years yet to run. The land is situated about three miles south of Webb City and about the same distance northeast of Joplin and is owned in fee by Judge W. M. Robinson, of Jefferson City, Mo., J. C.

Stewart, of Webb City, Mo., and others. The land has been mined more or less for about four years and several million pounds of zinc ore has been produced. Nearly every shaft sunk to a depth of 120 feet has penetrated the ore body and only the proper drainage is necessary to develop a majority of these shafts into good producing mines. Large ore bodies are known to exist on this ground and will doubtless be developed in the near future. The land is well located with reference to other good producing property and has unusually good transportation facilities, being directly on the line of both the Missouri Pacific and Kansas City, Ft. Scott & Memphis railways.

The Klondyke.

This company is composed of Rudolph Finke and others, of Carthage, Mo., who operate a sub-lease of ten acres of the Free Coinage lease. They have a complete concentrating plant equipped with two boilers, engine, crusher, rolls, steam jigs, elevators, screens, pump and steam hoister. The output of zinc ore reaches about 120,000 pounds per week. There are three shafts sunk to about the 140-foot level, in two of which large bodies of ore have been developed. A fourth shaft has been sunk to about the same level and a drift is being run to a body of ore known to exist. The company cleans ore for the operators on their mill, charging a toll of one-third of the product in addition to twenty-two and one-half per cent royalty. A royalty of fifteen per cent is paid to the Free Coinage company by the Klondyke company. The ground is open but very little timbering is necessary for the support of the drifts. The ore is hoisted with steam hoisters placed in each shaft, and two other shafts are being sunk but are not down to the ore level.

South Free Coinage.

This tract contains seventy-four acres, leased by the owners of the Free Coinage lease for a term of fifteen years at a royalty of fifteen per cent and has about eleven years yet to run. A sub-lease of twenty acres of this land was given to Messrs. Lively & Allison, who developed mineral at several different points on the ground and from which about 370,000 pounds of zinc ore was produced but on account of the accidental death of Mr. Allison, at his Alba mine, work was suspended about March 1st, last, and has since been idle. The ore bodies occur at about ninety feet below the surface and appear profitable if properly worked. There is a plant on this property equipped with boilers, engines, two twelve-inch lift pumps, steam hoister and jigs.

E. C. Cleaver.

E. C. Cleaver has a sub-lease on ten acres of this land, located at the southwest corner of the tract. He pays a royalty of fifteen per cent on zinc and seventeen per cent on lead and has developed a good face of zinc ore at a depth of ninety-two feet. The improvements consist of a steam hoister and hand jigs.

PEARL C. MINING COMPANY.

The Pearl C. is an incorporated company with F. L. Forlow, of Webb City, president; Robert Wheeler, vice-president, and G. F. C. Corl, secretary and treasurer. The company controls, by lease, three acres of land which is owned by the St. Joseph Land & Mining Co., Judge Waltour M. Robinson, president, the lease being a part of the Missouri Pacific and Memphis R. R. right of way. The company has also leased three acres adjoining, the fee of which is owned by W. H. Phelps, T. N. Davey, U. Hendrickson and others and upon which the concentrating mill of the company is located. This property is situated three miles south of Webb City and adjoins the Free Coinage mines on the north. The ground at these mines is extremely soft and requires heavy timbering for the support of the drifts. There are two shafts down to a depth of 145 feet, one being used for hoisting purposes while the other is used for a pump shaft. The production from these mines the first half of the present year was most remarkable but since that time several months of very valuable time has been lost on account of the strong water. In eighteen months, prior to January 1st, 1899, there was produced and sold from these mines more than 8,000,000 pounds of zinc ore. Additional arrangements for draining the ground have been perfected and the property will no doubt produce largely from this time on. The machinery consists of a complete concentrating plant with boilers of sixty and twenty-five horse power, two engines of thirty-five and twenty horse power each, twelve-inch crusher with steam jigs and hoister, and the necessary rolls, elevator and screens. The water is handled with an eleven-inch lift pump and a duplex four-inch discharge steam pump. The company has an office and scales on the ground and is under the management of G. F. C. Corl, of Webb City, Mo.

CENTRAL MINING COMPANY (MIDWAY).

This company is composed of Geo. W. Davidson and J. A. Bowman, of Webb City, Mo., and has a lease on ten acres of land owned in

fee simple by Harrison Bros., of Webb City. The company sub-leased the land to J. G. Gray, of Webb City, Mo., who now operates it. Mining operations commenced in 1897 and the first shaft was sunk to a depth of 140 feet at which level the ore deposits were developed, since which time about 6,000,000 pounds of zinc ore has been mined and sold. The ground is open and soft and requires heavy timbering to support the drifts. This property has proved very profitable to its owners and as there is a large amount of undeveloped ground to be worked, its production in the future should continue as profitably as in the past. Mr. Gray, the sub-lessee, has a complete concentrating mill, known as the "Little D.," supplied with a good boiler and engine, steam jigs, rolls, crusher, elevator, screens, steam hoister, pumps and all necessary equipment for successfully handling the ore. This property is situated about three miles south of Webb City and adjoins the Free Coinage on the east.

Cornfield Lease.

The Cornfield lease contains eighty acres, lying within the southern limits of Carterville and is the property of P. N. Davey and I. C. Henderson. The land is owned in fee simple by W. A. Daugherty, Jas. A. Daugherty and T. N. Davey and was first prospected for mineral in 1883 and since that time has produced about 8,000,000 pounds of lead ore and about 11,000,000 pounds of zinc. In all, some twenty or thirty shafts have been sunk, ranging in depth from fifty to 180 feet. At present there are but few shafts producing, although the ground is favorable for mining, being hard and requiring no timbering. With an efficient system of drainage, this land would be a very large producer.

T. C. CLARY & COMPANY.

This company is composed of Senator Lucian Baker, of Kansas, S. W. Snyder, of Leavenworth, Kansas, and T. C. Clary, of Joplin, Mo. They operate three lots of the McKibben land, situated about two miles east of Joplin. One shaft has been sunk to a depth of 115 feet with fifteen feet of very rich zinc ore developed. Two drifts are being cut fourteen by fifteen, which have developed the ore a distance of seventy feet in width. The ore occurs in medium open ground which requires timbering for the support of the drifts. The company pays a royalty of twenty-five per cent to the land owner and lessor and the production reaches about fifteen tons per week which is cleaned over two hand jigs. A crusher plant has just been completed, equipped

with a forty horse power boiler and a thirty-five horse power engine, one twelve-inch crusher, one set of eighteen-inch rolls, a steam hoister and a nine-inch lift pump. As this ground is very rich in mineral, the output will be very much increased when the plant is put to active operation. There are fourteen men given employment and the mines are under the management of T. C. Clary.

BAILY & STICKNEY LEASE.

This company owns a lease on thirty-two acres of mineral land situated about two miles east of Joplin, paying a royalty of ten per cent. The land is owned in fee simple by McCarty & Weymann, of Joplin, and is leased to above company for a term of ten years. There are six shafts sunk on the land to an average depth of ninety feet, five of which developed ore and three are producing. The company does a sub-leasing business only, and which business is in the hands of D. Purdy, of Joplin, Mo. Following are the operators on the Bailey & Stickney lease.

The Mascot Mining Company.

The "Mascot" is owned by Geo. H. Redell and Chris. Steinbach, of Joplin, Mo. They control three lots of the Bailey & Stickney lease and have three shafts down to an average depth of ninety feet in open ground which requires timbering for the support of the drifts. A fair face of zinc ore is developed and when mining regularly from ten to seventeen tons per week are produced. Their improvements consist of two eight-inch lift pumps with which the ground is drained, one ten-inch crusher, one set of sixteen-inch rolls, a steam hoister and four hand jigs.

Little Pete.

The "Little Pete" is the property of Armington & Armstrong, of Joplin, Mo., who are operating on the Bailey & Stickney lease and have a very good body of zinc ore developed at the depth of ninety feet in open ground. Their improvements consist of a small boiler and engine, a belt hoister and three hand jigs.

Randall & Company.

This company is composed of Guy Davis, M. Bonham and M. Evans, of Joplin, Mo. They control two lots of the Bailey & Stickney lease and have one shaft to the depth of ninety-five feet with zinc and lead ore developed in open ground. They employ six men and make a weekly production of about five tons of zinc ore. A s^t

steam pump and hand jigs are used. E. V. Shull, of Joplin, is superintendent.

Keystone Mining Company.

The members of this company are Thos. Wolf, G. J. Radburn, J. S. Good, Fred Owen and D. E. Jones. They operate two lots on the Bailey & Stickney lease and have two shafts sunk, one eighty-three and the other to the depth of 100 feet. At the depth of 100 feet a good body of high grade zinc ore has been developed twenty-six by fourteen feet. The ore occurs in open ground and a weekly production of about ten tons is made with twelve men employed. Their improvements consist of a steam hoister, steam pump and four hand jigs.

The Grub Worm Mining Company.

The Grub Worm Mining Co. controls four lots located on the Pearl lease, situated about two miles east of Joplin and which adjoins the Bailey & Stickney. They have one shaft down to a depth of ninety feet, at which level a very good body of lead and zinc ore has been recently developed in open ground which requires timbers for support of the drifts. They pay a royalty to the land owner and employ seven men. Their improvements consist of a boiler, belt hoister and two hand jigs.

CARTERVILLE DISTRICT.

THE ELEVENTH HOUR MINING CO.

The Eleventh Hour mines have been for years among the greatest producers in the district and have netted both the owner of the fee and the lessee great sums of money. The mines are situated on a lease containing 120 acres, about two miles southwest of Webb City and to the south of Carterville. The land is owned in fee simple by Mrs. E. J. Chinn, of Webb City, Mo., and the lease is the property of J. W. Aylor, of Webb City, who pays Mrs. Chinn a royalty of seven and one-half per cent. Mr. Aylor also owns in fee a forty acre tract adjoining the lease and the entire property is under the efficient management of Mr. Ben C. Aylor, with J. W. McMunn as weighmaster and clerk. The land is platted into lots 200 feet square, on a large majority of which shafts have been sunk and great bodies of ore encountered. It is on this lease that the deepest shafts in the district are located. One shaft has been sunk on this ground to a depth of 245 feet, encountering extremely rich ore at this level, and dirt is being hoisted from below the 200-foot level. Large sums of money have been expended for

pumping plants and the ground is reported thoroughly drained for operators. Mention of some of the operators on the lease follows.

Raymond & Company.

Raymond & Co. have a sub-lease of five lots on the Eleventh Hour ground. The company is composed of A. D. Hatton, C. E. Matthews, and O. J. Raymond, of Webb City, Mo., J. W. Loomis, of Battle Creek, Michigan, and F. M. Sigler, of Hot Springs, Ark.; Mr. Raymond acting as superintendent. Two shafts are operated at 185 feet and they have an ore body thirty feet thick from which they make an average output of forty tons per week. The ground on this lease is hard and does not require timbering. The improvements consist of a complete concentrating plant equipped with an eighty-five horse power boiler, forty-five horse power engine, fifteen-inch crusher, three sets of rolls, steam jigs with five cell rougher and six cell cleaner, elevators, screens, a steam hoister and centrifugal pump. The mine is a steady producer and a profitable investment for the owners.

Jourdan & Son.

This company is operating three lots on the Eleventh Hour ground on which they have a very large face of ore and their average weekly output is about twenty-five tons. They have a complete concentrating plant equipped with an eighty horse power boiler, thirty horse power engine, fourteen-inch crusher, three sets of rolls, steam jigs with four cell rougher and five cell cleaner, screens, elevators, steam hoister, etc. Gus Jourdan is the manager of the property.

Miller & Company.

This company is composed of J. C. Miller, W. O. Craig, and B. F. Mosher, all of Carterville. They have three lots sub-leased of Mrs. E. J. Chinn, who owns the land in fee simple. It was on these three lots that the original discovery of ore was made in 1888 which resulted in making the Eleventh Hour ground famous. The shaft of the company is down 175 feet and the ground is being worked at this level but the old level was 100 feet, at which depth there was also a big face of ore. The ground is hard, with a good face of ore, and the weekly output is about twenty tons of zinc in addition to the lead. The company employs about seventeen men. They find their richest lead in the upper level above the zinc, there being but little lead at the lower level. The company have a complete mill equipped with forty horse power boiler, thirty horse power engine, fourteen-inch crusher, two sets of rolls, revolving screens, steam jigs with three cell rougher and four

cell cleaner, steam hoister, elevators, etc. The ground is under the management of W. O. Craig.

The Irene S. Mining Co.

The Irene S. Mining Co. is operating two lots on the Eleventh Hour ground. The company is composed of Chris and M. L. Johnson, of Carterville, Mo., and S. Sternburg, of St. Louis, Mo. They secured their sub-lease in 1894, which they have worked continuously since, making a very good weekly output. Their shaft is down 200 feet and they have a good face of both lead and jack about fourteen feet high. The improvements consist of a complete concentrating plant with all the necessary machinery to successfully handle the ore, which is of a very high grade.

Blue Grass Lead & Zinc Co.

This company operates three lots on the Eleventh Hour ground and have two shafts down 180 feet, both in good ore. The ore face is eight feet high and twenty-five feet wide and is constantly widening out as the ground is opened up. Frank Danglede, of Webb City, is the superintendent and he employs about fifteen men, single shifts, making a weekly turn-in of about twenty tons of zinc and 6,000 to 25,000 pounds of lead. The plant of the company is equipped with forty horse power boiler, thirty horse power engines, fourteen-inch crusher, two sets of rolls, steam jigs with five cell rougher and six cell cleaner, screens, elevators and two steam hoisters, the whole plant costing about \$5,500 when built.

B. C. Aylor & Co.

This company is operating the lots formerly worked by Hume & Co. They have five lots and three shafts down to the 180-foot level, with ore faces of from twenty-five to thirty feet in all three. They work eighteen men, single shifts, and the mines are under the management of Ben C. Aylor, the output being from 40,000 to 60,000 pounds of zinc ore weekly. The mill cost about \$5,500 and the equipment consists of a forty horse power boiler, twenty-five horse power engine, fourteen-inch crusher, two sets of rolls, steam jigs, screens, elevators, steam hoisters, etc.

Nutmeg Mining Co.

The Nutmeg Mining Co. is composed of O. J. Raymond, Amos D. Hatton and C. E. Matthews, of Webb City, Mo., B. W. Coffin, of Indianapolis, Ind., and a Mr. Bates, of Chicago. They are operating three

lots and have three shafts down 180 feet with a good ore face in all three, the face being about ninety feet wide by about twelve to fourteen feet high. The average weekly output is from 40,000 to 80,000 pounds of zinc and from 8,000 to 40,000 pounds of lead. O. J. Raymond, of Webb City, is the superintendent. The mill of the company is equipped with sixty horse power boiler, forty horse power engine, fourteen-inch crusher, three sets of rolls, elevator, screens, steam jigs, steam hoisters, etc.

James Gladden.

James Gladden, of Johnstown, Mo., is operating three lots and has three shafts down to the 180-foot level, producing from fifteen to twenty tons per week, with twelve men employed. He has a mill of moderate capacity, costing when built something like \$3,500.

McKINLEY MINING COMPANY.

The McKinley Mining Co. is incorporated under the laws of the state of New Jersey and has its offices at Trenton, N. J. The company is composed of eastern capitalists. The lease was first opened up by John F. Wise and Thomas Connor, of Joplin, Mo., in 1896. The fee simple of the land was owned by Mr. Connor and the tract covered by the lease embraces sixty acres lying about two and one-half miles southeast of Webb City. The lease was sold to the present company in June, 1898. The land was developed with a steam drill to a depth of 200 feet and lead was encountered at ninety feet, while zinc ore was developed at 135 feet from the surface and is reported to have continued down to a depth of 200 feet, giving a sixty-five-foot face of what proved to be exceedingly rich zinc ore, and from which the company have turned in as high as 100 tons per week, besides many thousand pounds of lead from the four shafts in operation. There are two concentrating mills in operation on this lease which passed to the present company at the time they purchased the lease. The McKinley mill has a large capacity and is equipped with a 100 horse power boiler, eighty horse power engine, fourteen-inch crusher, two sets of rolls, steam jigs with four cell rougher and five cell cleaner, elevator, screens, etc., and steam hoister. The company has been working on the lower run of ore and apparently has no trouble in keeping the ground well drained with an eight-inch Dean pump which also furnishes the water to run the mill. The second mill is known as the "Spot Cash" and is also very complete and powerful, having an eighty horse power boiler, forty horse power engine, fourteen-inch crusher,

two sets of rolls, steam jigs with three cell rougher and four cell cleaner, elevators, screens, and a steam hoister. Charles Moore, of Joplin, is the general manager of the company's property in this district and employs about eighteen men at this time.

The Good Enough.

The "Good Enough" Mining Co. is operating two lots of the McKinley lease and is composed of Ed. Nelson and Miles Deer, of Joplin, Mo., and Thomas Hill, of Prosperity, and Richard and James Carter, of Webb City, Mo. The company has two shafts down to a depth of 190 feet, at which level a very extensive and rich deposit of both lead and zinc has been developed. The ground is hard and no timbering is necessary for the support of the drifts. To handle the large amount of ore produced, a new concentrating plant was erected last spring at a cost of \$5,900. The mill is equipped with an eighty horse power boiler, forty-five horse power engine, fourteen-inch crusher and three sets of rolls, Faust steam jigs with five cell rougher and six cell cleaner, thirty by forty-two steam hoister, elevators and screens and all other necessary machinery. The company employs about twenty men and produces about 30,000 pounds of lead and from 40,000 to 60,000 pounds of zinc ore weekly.

Ealor Lease.

This tract contains eighty acres and lies just south of Carterville and is owned by Wm. McMillan, P. N. Davey, and W. A. Daugherty. The property is leased to W. A. Daugherty, Jr., L. C. Henderson and Paul N. Davey. About twenty shafts have been sunk on the lease, ranging in depth from 130 to 165 feet. At some points on the land ore was encountered at a depth of 100 feet from the surface. The land has produced, since 1891, about 3,000,000 pounds of lead and 16,000,000 pounds of zinc ore, and will without doubt be again in the field in the near future as a big producer.

Jasper Lead & Zinc Company.

This company is composed of D. A. Bailey and D. A. Bailey, Jr., and James Gammon, of Webb City, Mo. They are operating three acres of land, just south of Webb City, belonging to General John W. Noble, of St. Louis. This ground was first developed about 1888 and has since produced large quantities of both lead and zinc ore. The present working level of the ground is at 110 feet, but the pump shaft is sunk to a depth of 187 feet. The land is producing at the present

time with hand jigs about four tons per week. The ground is under the management of D. A. Bailey.

Funk, Bowman & Company.

Funk, Bowman & Co. are operating two lots in the Hough & Furness addition to Webb City. The company is composed of F. J. Funk, of Marion, Kansas, W. M. Bowman and Mrs. F. Bradford, of Webb City, Mo. The first development of lead and zinc ores on what is known as "Sucker Flat" was made on these lots by Mr. Steelman while sinking a well and thousands of dollars' worth of ore has since been produced and marketed from them. The present company purchased the fee simple of the lots in 1892 and since that time have received \$25,000 from the sale of the ore produced on them. The most extensive ore bodies are at the 190 foot level, but the strong water greatly interferes with working at this depth. The property is under the management of Mr. Bowman.

THE ELK LEAD & ZINC COMPANY.

The Elk Lead & Zinc Mining Co. is composed of W. E. Haymond, J. P. & J. C. Stewart, J. Daugherty and W. F. Morrison, with Mr. Haymond as president, J. C. Stewart secretary, and J. Daugherty as superintendent. The company owns a lease on 100 acres of land situated in the southern limits of Webb City, eighty acres of which is in fee simple owned by A. U. Hough, of Carthage, Mo., and the remaining twenty acres by Elliott & Zimmermen. The company maintains a large pumping plant, equipped with seven large pumps, three of which are steam, three Dean, and one Snow duplex. Only a part of the pumps are run at one time to handle the water, the others being held in reserve. The water level is 200 feet on this ground and there are five shafts down, all in ore. The present company succeeded Curtin & Raymond in the latter part of 1897. The operators on the ground are as follows.

Dowell, Baldredge & Co.

This company is composed of A. Dowell and W. Rue, of Joplin, Mo., J. H. Miner, of Pittsburg, Kansas, and Dr. Baldredge, of Galena, Kansas. They operate a forty acre tract, four miles southeast of Joplin, belonging to Mitchell, Block & Conn, of Carthage, Mo. The royalty is ten per cent on all ore mined and a large number of shafts are going down on the land. Lead ore is found at a depth of fifty-five feet, while the level for zinc ore is from sixty-five to ninety feet. The machinery in use at present consists of a steam pump, steam

hoister and hand jigs. The ground is very promising and a good output is expected from it in the near future.

The Herold Mines.

The Herold Mines are owned by Ferd Herold and Oscar Herold, of St. Louis, are located on a sixty acre lease of the Thomas Connor land, situated about two miles southeast of Webb City, Mo. There are six shafts on the land ranging in depth from 150 to 225 feet. The deep shaft is used for pumping and hoisting purposes. The ore deposits are developed at about 185 feet from the surface and from this level very good weekly productions are made. On account of the hardness of the ground, timbering is unnecessary to support the drifts. This lease has one of the most complete and costly concentrating plants in the entire district, containing all modern improvements and equipped with two eighty-five horse power boilers, three engines of eighty-five, twenty-five and ten horse power each, one fourteen-inch crusher, two sets of rolls, steam jigs with five cell rougher and six cell cleaner, settling tanks, revolving screens, elevators, steam hoister, an eleven and a twelve-inch lift pump, a Duplex pump and a complete drilling outfit. The mine is operated by Oscar Herold, of Webb City, who employs eighteen men.

ROBERTA MINING COMPANY.

The Roberta Mining Co. is composed of Ohio gentlemen and is incorporated under the laws of that state with Mr. B. M. Kirkner president, Robert Reynolds secretary and treasurer and F. K. Kirkner manager. All the members of the company are residents of Cincinnati. The lease contains forty-six acres, forty of which are owned in fee simple by E. L. Baker, of St. Louis, the balance being the Kirk land. This land was first prospected and partly developed by Fred Hill in 1893, during which time he produced about \$30,000 worth of lead ore. The water finally became so strong and the price of mineral so low that he at last abandoned the lease, which remained shut down until the present company assumed control about eighteen months ago. There are two shafts down to a depth of 200 feet and a face of lead eight by thirteen feet is being worked, while a big face of zinc has been opened up in two drifts that is producing about 60,000 pounds per week. The pumping plant is efficient and thoroughly drains the ground. There is a complete concentrating plant which cost about \$6,000. The boiler capacity is about 175 horse power and there is a 100 horse power Atlas engine, steam jigs with five cell rougher and

six cell cleaner, three sets of rolls, elevators, screens, etc. About thirty men are employed and the ore produced is loaded on cars on the Memphis switch right at the bins of the company.

GEM VALLEY MINING COMPANY.

The Gem Valley Mining Co. is composed of S. F. Clark and W. M. Wilson, of Webb City, Norman Schuerman, of Prosperity, and E. U. Apple, of Joplin. This company is operating on a twenty acre lease about one-half mile northwest of Duenweg, on a part of the Livermore farm. The present company obtained its lease about one year ago and commenced the sinking of a shaft which opened up a very good face of ore at seventy-three feet. The drill hole previously put down showed the presence of ore to a depth of 105 feet. One shaft has been sunk to eighty-five feet, at which level two eight-foot drifts have been cut a distance of 180 feet and both are reported to contain very rich ore deposits. The second shaft is down to a depth of sixty-two feet and has shown both lead and zinc of fair quality. Only three men are employed in the development work, it being the intention of the company to build a concentrating plant when the ground is thoroughly tested. The lease is under the management of Mr. E. U. Apple, of Joplin, Mo.

HANNUM & McELROY.

Hannum & McElroy have been operating what was formerly known as the Richland tract of thirty acres, south of Carterville, the fee of which was owned jointly by them and B. F. Hatcher, of Scotland, Mo. This property was sold in July of this year to the American Zinc, Lead and Smelting Co. Hannum & McElroy have a lease running ten years at ten per cent. They have one shaft down to a depth of 183 feet which they use as a pump shaft and from which they are hoisting dirt at the 168-foot level where they have a face of ore twenty feet high and 100 feet wide. They employ twenty men and the average turn-in from the company's shaft has been sixty to seventy tons of jack per week, but from this time on the output will be greatly increased, as four splendid new mills were completed about the first of July, all of which are now in operation. The company have one of the finest double plants in the district, with a capacity of 200 tons per shift. The plant is equipped with two seventy horse power boilers, and two boilers of sixty and forty horse power, respectively, at the pumping station. The engine is of eighty horse power and they have two Snow pumps, 10-6-10, four-inch discharge, and at the pump shaft

which is five by seven feet in the clear they have a ten-inch lift pump. They drain the ground with one pump, keeping the other in reserve. A cage is used in the pump shaft for hoisting and the two plants are duplicated throughout and are equipped with ten-inch crushers, two sets of rolls, Cooley steam jigs with four cell rougher and five cell cleaner, screens, elevators, etc., and Wormer steam hoisters. A big ore body has been developed on this ground by the present energetic management. In two six-inch drill holes put down, ore was encountered at 170 feet which continued to 225 feet, and in another six-inch hole twenty-five feet of ore was penetrated, when the drill was pulled. The average working level of this ground is about 140 feet and the water is easily handled. There are nineteen sub-lessees on the ground, some of whom are mentioned below.

Cass & Beaseley.

This firm is composed of A. A. Cass and Green Beaseley, of Carterville, who are operating two lots on a ten year lease, paying twenty-two and one-half per cent royalty on zinc and thirty-three and one-third on lead. They completed a splendid modern concentrating mill in July of this year, on which they handle the dirt from their two shafts, which are both in good ore at 148 feet. They employ about twenty men and their mill is equipped with 100 horse power boiler, sixty horse power engine, six-drill Ingersoll air compressor, sixteen-inch crusher, three sets of rolls, Cooley jigs with four cell rougher and five cell cleaner, elevators, screens, etc. They use the Freeman hoister.

A. A. Cass & Co.

This firm is composed of A. A. Cass, Thomas Moore, John Moore and Wm. Bunton. They operate two lots of the Hannum & McElroy ground under a ten year lease and have a shaft down 168 feet with an ore face 160 feet wide and ten feet high. They employ about twenty men and make an average output of thirty tons of jack and 3,000 pounds of lead ore per week. Their mill is a new and first-class one in every respect and is equipped with 100 horse power boiler, sixty horse power engine, Ingersoll air compressor, sixteen-inch crusher, three set of rolls, elevators, screens, Cooley steam jigs with four cell rougher and five cell cleaner, and Freeman hoister.

Beckwith & Gilbert.

This firm is composed of Springfield, Mo., parties who operate two lots and two fractional lots of the Hannum & McElroy ground under

a ten year lease. They have two shafts down 168 feet, both in good ore, and completed a splendid new mill about August 1st, and will add greatly to the turn-in from this ground. They employ twenty men and their mill is equipped with 100 horse power boiler, sixty horse power engine, sixteen-inch crusher, three sets of rolls, Ingersoll air compressor, Cooley steam jigs with four cell rougher and five cell cleaner, elevators, screens, etc., and they use a Freeman steam hoister.

Osceola Mining Company.

This company is composed of J. McFarland, M. E. Burson, J. W. Hood, G. W. Hinchey and J. R. Gray, all of Carterville, Iowa, and C. W. Whitsell of Carthage, Mo., the latter being superintendent and general manager. They operate two lots and two fractional lots under a ten year lease and have a big body of ore, which occurs in "sheet" formation at 168 feet. They have two shafts down to this level and clean the dirt on a splendid modern mill built by the Carterville foundry. They work the ground with Ingersoll air drills run by a Laitland, five drill compressor and their mill is equipped with a 100 horse power boiler, forty-five horse power engine, Freeman hoist, sixteen-inch crusher, three sets of rolls, Carterville jigs with four cell rougher and five cell cleaner, screens, elevator, etc. At the 140-foot level on this ground there is a drift 1,000 feet long, which is probably the longest drift in the district.

BECKWITH & HALL LEASE.

This is the property of H. H. Beckwith, W. E. Hall, James Luke and H. C. Cowgill, all of Carthage, Mo., who leased of Judge McGregor in 1893 the tract containing forty acres and is situated one mile south of Carterville. Ore was soon developed at 150 feet by H. M. Gilbert in what is known as the "Wonder" shaft. Other developments followed and the lease soon became one of the leading producers of the district of both lead and zinc ore. The ground is hard, requiring no timbering, and the ore is found in sheet formation, air drills being used to break the dirt on account of its hardness. The land is well located with reference to other good and productive mines and it is reasonable to suppose that this ground will be among the lasting producers. There are two very complete concentrating plants on this ground, mention of which follows.

The Wonder.

The Wonder Mining Co. has a lease on five lots of the Beckwith & Hall lease and the company is composed of H. H. Beckwith, H. M.

Gilbert, J. A. McGoffin, Gus. J. Schive and Mr. Postal, of Mascoutah, Ill. The company is operating a new shaft on the Wonder lease and have it sufficiently developed to yield a production of about 80,000 pounds of zinc and 20,000 pounds of lead ore weekly, giving employment to about thirty men. A ten foot drift is being worked in hard ground with mineral in top, sides and bottom. The company have made improvements costing about \$5,000, consisting of a complete concentrating plant equipped with an eighty-five horse power boiler, sixty-five horse power engine, fourteen-inch crusher and two sets of rolls, steam hoister, steam jigs with four cell roughers and five cell cleaner and the usual screens, elevators, etc. The ground is broken with air drills run by a four machine compressor. The property is managed by H. M. Gilbert.

The Opal Mine.

This company has also a sub-lease on fifty lots of the Beckwith & Hall lease and is composed of H. H. Beckwith, R. Finke, and J. A. McGoffin, of Carthage, Mo., and the Postal Bros., of Mascoutah, Ill. The Opal company began sinking their shaft in the latter part of 1897 and put it down to a depth of 141 feet, at which level the ore deposit was encountered and drifting was at once begun on a ten foot face of both lead and zinc ore. Like the "Wonder," the ground is hard and timbering is unnecessary and an air drill is used to break the ground. The company gives employment to about thirty-five men when working double shifts and produces about 70,000 pounds of zinc ore and 15,000 pounds of lead weekly. The improvements consist of a complete concentrating plant equipped with an eighty-five horse power boiler, thirty-five horse power engine, fourteen-inch crusher, two sets of rolls, steam jigs with three cell rougher and four cell cleaner, elevator and screens,, steam hoister and three drill air compressor, the whole costing about \$4,000. H. M. Gilbert is superintendent of the mines.

THE HOMESTEAD.

The Homestead is the property of S. C. & W. B. Edgar, of St. Louis, Mo., and contains eighty acres situated one mile south of Carterville. It is better known as the Motley ground, from the name of the former owner of whom Mr. Edgar purchased it a few years ago. The property produced several million pounds of lead and zinc several years ago, but was almost abandoned during the period of depression and low prices from 1893 to 1896-7, and it is only within the last few

months that the ground has resumed its old time activity and new and extensive deposits of both lead and zinc have been developed. The company have two shafts down to the 200-foot level, from which a good output is being made. They have a pumping plant in operation and have recently erected one of the most complete concentrating plants in the district which has a capacity of 100 tons per shift and is supplied with ample boiler and engine power, crusher, rolls, elevator, screens, steam jigs with five cell rougher and six cell cleaner, two steam hoisters and all other necessary appliances. The ground is broken with air drills supplied with power from a Norwalk compressor and no timbering is necessary. George W. Warne, of Carterville, is manager of this and the Blue Wing properties.

The Blue Wing.

The "Blue Wing" is the name given to the old S. C. Edgar property and adjoins the Homestead on the north. This is also a part of the Motley ground and is owned in fee by T. T. Luscomb, of Carthage, and is operated under a lease by S. C. Edgar, of St. Louis. In former years this was one of the principal producing properties in the Webb City and Carthage district, but the low prices prevailing for some years and the strong water caused an almost total suspension of work on the ground. The property is now thoroughly drained and a new and complete concentrating plant has been erected equipped with first-class modern machinery. The ore bodies are extensive and the working level is about 155 feet. The ground is hard, requiring no timbering, and is broken with air drills.

MT. ARRAAT MINES.

The Mt. Arraat mine is situated about two miles southeast of Webb City and south of Carterville and is one of the highest points in Jasper county. The owners of the property are Thomas W. Hill, of Prosperity, Mo., and Johnson & Morgan, of Joplin, Mo. They have a lease on ten acres of land at a royalty of twenty per cent, the land being owned in fee simple by Thomas Connor, of Joplin, Mo. The company have two shafts down to a depth of 200 and 224 feet respectively with a large body of rich lead and zinc ore in the 200 foot shaft, and a 100 foot face of rich lead and zinc ore in the 224 foot shaft. This property is new and among the most promising of any in the district. One of the most complete and modern concentrating plants in the district was completed in July of this year at a cost of \$8,500. It is a model in every way and is equipped with two eighty horse power

boilers, seventy-five horse power engine, fourteen-inch crusher and three sets of rolls, two twenty-four-inch and one set of chat rolls, revolving screen, elevators, steam jigs with five cell rougher and six cell cleaner, two steam hoisters, pumps, etc. Although this is one of the deepest mines in the district, the ground is thoroughly drained. Thomas W. Hill is the manager of the property. Following are some of the operators on the ground.

Wertz & Co.

This company is composed of Dave Wertz and John Sales, of Webb City, and Frank Guenlee, of Prosperity, Mo., and they operate one lot of the Mt. Arraat lease with one shaft down to a depth of 163 feet which shows a face of from twenty to thirty feet of good ore similar to that found in the Mt. Arraat mines. This mine is just being opened up and the only machinery at present is a steam hoister.

Wagner & Co.

This company is composed of Muncie, Ind., parties who control two lots of the Mt. Arraat lease and have a shaft down to a depth of 180 feet with a face of both lead and zinc ore of from ten to twelve feet. The dirt is raised with a steam hoister.

Baker & Wilber Mining Co.

The Baker & Wilber Co. is composed of A. J. Baker and J. Grant Wilber, the agent of the Missouri Pacific road at Webb City. They are operating one lot of the Mt. Arraat lease and have their shaft down to a depth of 193 feet, at which level both the ore body and the water was reached. A steam hoister is used to raise the dirt.

Glasscock & Whittaker.

The members of this company reside in Prosperity and are operating one lot of the Mt. Arraat lease. Their shaft is down to 107 feet and they are just entering the ore body. Horse power is used to raise the dirt.

SILAS O. HEMINGWAY.

S. O. Hemingway is operating a forty acre lease of the Connor land and twenty-five acres adjoining, which is owned in fee simple by C. A. and T. A. Parker, of Webb City, Mo. This lease is situated about two miles southeast of Webb City and adjoins the Cherokee on the south. A shaft has been sunk to a depth of 200 feet and drifting has

been commenced. A three-inch discharge Snow steam pump is used to drain the ground and a steam hoister is used to raise the dirt.

Stewart, Sharp Brothers & Co.

This company is operating one lot of the Hemingway lease and are opening up a fine body of zinc and lead ore at a depth of 219 feet. The company have a thirty-five-foot face of ore which is very promising and the shaft was still in ore when sinking was suspended. From eight to ten tons of ore was cleaned up in sinking the shaft. This is a new mine and gives promise of becoming a very profitable piece of property. The machinery at present in use consists of a three-inch discharge Snow steam pump, steam hoister and hand jigs.

CONNECTICUT MINING CO.

This company is composed of A. Howard, Stafford Springs, Conn., H. F. Royce, Willimantic, Conn., C. E. Hodkins, Joplin, L. J. Stevison, Webb City. This company is operating eighty acres, being the N. W. quarter of the N. W. quarter of section 4, township 28, range 32, and the N. E. quarter of section 5, township 28, range 32, situated four miles southeast of Webb City. Two drill holes were put down in the southwest corner of the east forty and in one of the holes good lead and jack was developed and a pump shaft has been sunk over one of the drill holes and the ore body was entered at sixty-five feet and a drift was run opening up an eight-foot face which is widening out. A second shaft was sunk northwest of the pump shaft, in which a very rich run of ore was struck at forty-five feet and they were still sinking in ore on July 19th. The company will operate a great part of the land and will erect one of the largest mills in the district on the ground. The machinery at present consists of a forty horse power boiler, a ten by thirty-six Cook steam pump, and a Freeman hoister. The lease on this ground runs ten years at ten per cent. L. J. Stevison is the manager for the company. They have ample capital and will thoroughly develop the property.

CARTERVILLE DISTRICT.

CARTERVILLE MINING COMPANY.

The Carterville Mining Co. is composed of T. N. & Paul N. Davey, of Carthage, Mo., who own a lease on the land of the North & South Carterville Mining Co., the two leases being consolidated in 1896. The lease covers eighty acres within the incorporated limits of Carterville

and is owned in fee simple by T. N. Davey, C. C. Allen, W. A. Daugherty and William McMillan. Prior to the latter part of 1896, the production of these tracts of land was kept separately, but they are now reported as one and they are in fact almost inseparable, being closely connected with the early history of the Carterville district and were about the second tracts to be opened up for mining in the Webb City and Carterville districts. Mining operations began on this tract in the early part of 1876 and shafts were sunk to a depth of 175 feet, disclosing large bodies of ore of high grade in hard ground requiring little or no timbering. The two tracts produced from 1876 to 1899, 201,537,855 pounds of zinc ore, valued at \$2,334,154.35, and 21,444,605 pounds of lead ore, valued at \$505,110.78, making a total money value of \$2,839,265.13. The output of this land has been restricted for some years on account of very strong water and the low prices for ore, but in view of the present splendid condition of the ore market and the general demand, a big increase in the production can be looked for in the immediate future. The land is now producing about 200,000 pounds of zinc per week and the output can easily be increased. Following are some of the operators on the company's land with their improvements.

Webb City Milling Co.

The Webb City Milling Co. is composed of C. W. Palmer, James Ball and George Evans, of Webb City, and their custom mill is located on the South Carterville ground where they clean rough ore for the operators who are without steam machinery. They also work tailings. Their plant is very complete and was erected at a cost of about \$6,000. It is equipped with forty horse power boiler and thirty horse power engine, fourteen-inch crusher and three sets of rolls, two pairs of fourteen-inch and one set of eighteen-inch, a Robinson steam jig with four cell rougher and four cell cleaner, screens, elevators, etc. The mill is well fitted for general work and makes a satisfactory production. C. W. Palmer, of Webb City, is superintendent.

Stamp & Morris.

This company is composed of J. M. Stamp, of Carterville, Mo., and George L. Morris, of Chatham, N. Y., who operate five lots on the ground of the South Carterville Company paying a royalty of twenty-two and one-half per cent on zinc and mining lead on the \$28 basis. They employ twelve men and make an average turn-in of fifteen to twenty tons of zinc ore working at the 100 foot level on a thirty foot

face of ore. J. L. Stamp, of Carterville is the superintendent. They have a complete concentrating plant equipped with eighty-five horse power boiler, forty horse power engine, twelve-inch crusher, three sets of rolls, steam jigs with four cell rougher and five cell cleaner and Freeman hoister.

Eastern Star Mining Company.

The Eastern Star Mining Company is a new company and was organized June 26, 1899, with a capital of \$15,000. The company is composed of Porter Hooker, of Leavenworth, Kansas, Albets Bros. and Cordele Humphrey, of Webb City with the latter as superintendent. They are operating two lots on the North Carterville ground and have two shafts down to a depth of 140 feet both in good ore with a thirty foot face in each. One of the shafts is seven by four feet and is used for a pump and hoisting shaft and the other shaft is four and one-half by five feet. They have a new 100 ton mill equipped with seventy-five horse power boiler, forty horse power engine, fourteen-inch crusher and three sets of rolls, steam jigs with four cell rougher and five cell cleaner, Wormer hoister, and four-inch Worthington discharge pump. They employ forty men, double shifts, and will make a large weekly output when they get the ground thoroughly opened up.

THE PERRY LEASE.

The Perry Lease is the property of E. N. Perry, of Joplin, and is located at the southern limits of Carterville and adjoins the Eleventh Hour land. The lease contains forty acres and is owned in fee simple by J. Litteral, of Carterville, Mo. In addition to this lease, Mr. Perry owns in fee simple ten acres adjoining this tract on the west. This land is known to be very rich in ore, but it appears that the water is very strong, requiring heavy pumps to drain it, but the ground is extremely hard, requiring no timbering. Mr. Perry has a pumping station equipped with an eighty horse power boiler, sixty horse power engine and two thirteen-inch lift pumps. There are three concentrating mills on this land, owned by the Eagle Mining Company., the North Star and the Anna D. companies, respectively. The lease is under the management of E. J. Tutty, of Carterville, Mo.

EAGLE MINING COMPANY.

The Eagle Mining Company is organized with A. B. Wilgus, as president, and D. N. Cutter, superintendent. They are operating five lots of the Perry ground and have three shafts down to ore at the 200

foot level. The ore face is seven to ten feet high and fifteen feet wide and is widening out as the ground is opened up. Twelve men are employed at this place and the ground will no doubt figure in the output as a good producer from this time on. They have a plant equipped with seventy-five horse power boiler, sixty horse power engine, fifteen-inch crusher, two sets of rolls, steam jigs with four cell rougher and five cell cleaner, elevator and screens and use Freeman steam hoisters to raise the ore. The plant cost about \$8,000.

EALOR LAND.

MUNCIE MINING COMPANY.

The Muncie Mining Company is composed principally of the Branch Bros, of Muncie, Ind., who have four lots leased on the Ealor land with two shafts down to a depth of 160 feet. They employ twenty-eight men and average twenty tons per week, working single shifts at the mill, and double shifts in the ground. Their mill is equipped with eighty horse power boiler, sixty horse power engine, fourteen-inch crusher, three sets of rolls, steam jigs with four cell rougher and five cell cleaner, screens, elevator, etc. They have a thirty foot face of ore in each shaft and use Freeman hoisters to raise the ore. The mill is new and modernly built and was started June 10, 1899.

CORNFIELD GROUND.

BLACK DIAMOND MINING COMPANY.

The Black Diamond Mining Company is an incorporated company with Lee Chick, president; S. D. Lanyon, vice-president; J. W. Batten, treasurer, and W. B. Hixson, secretary. They are operating two lots of the Cornfield ground, paying a royalty of twenty per cent on zinc ore and thirty-three and one-third on lead ore. They have two shafts down to a depth of 164 feet, both in excellent ore. They are working at present at the 140 foot level with a face of ore eighteen to twenty feet high which is widening out. They have a new and modern mill which was completed and started July 11, 1899. The mill is equipped with two boilers of thirty and sixty horse power, thirty-five horse power engine, ten-inch crusher and three sets of rolls, Cooley, self contained jigs with four cell rougher and five cell cleaner, and Leckie improved steam hoister. They employ twelve men, single shifts, and will make a good output judging from the looks of their ground and their mill.

THE MOHAWK MINING COMPANY.

The Mohawk Mining Company's lease of eight acres on the Plutocrat lease of the Thomas Connor ground at Cartersville, is now owned by Col. Thomas J. Steers, of Joplin, one of the most experienced and successful miners in the district. Col. Steers developed the Get There lease and turned it from an unproductive property into one of the most profitable tracts in the district and appearances indicate that he will accomplish the same result on the Mohawk ground. He has one shaft down to a depth of 204 feet and is drifting at 186 feet on good ore. He has a complete modern concentrating plant and a very efficient pumping system, using one Dean six-inch suction, five-inch discharge pump and a Worthington four-inch suction, three-inch discharge. The mill is equipped with three boilers of sixty, eighty and one hundred horse power each, a thirty-five horse power engine and a two drill compressor for Ingersoll drills. It has a large crusher, three sets of rolls, steam jigs with three cell rougher and four cell cleaner, elevator and screens and Freeman hoister. Twenty-five men are employed in the ground, working double shifts.

THE NEVADA LEASE.

This lease contains forty acres and is located north of the Centre Creek ground. Hon. John B. Cole, of Lamar, Mo., and others owners of this lease sold it recently but we were unable to learn the names of the new owners. The property is under the management of the old superintendent, S. F. Clarke, of Webb City, Mo. This property has added very little to the production of the district for the past few years, but from appearances it is good mineral land and with the proper management it should be profitable to its owners. The improvements consist of a mill equipped with a twenty-five horse power boiler, fifteen horse power engine, crusher, rolls, elevator, screens, steam jigs with rougher and cleaner and horse hoister.

PATTEN, STEIN & COMPANY.

This company owns a lease on forty acres of the Chas. E. Elliot and John J. Zimmerman land, situated on the southeast of Webb City. The company is composed of Warren Patten, of Carthage, Mo., who is manager, Mr. Stein, of Terre Haute, Ind., and Mr. Beach, of St. Louis, Mo. A sub-lease on four lots of this ground is held by J. D. Hurd, of Chicago, Ill., on which there is in operation a complete concentrating plant, costing about \$5,000. The plant is equipped with ample boiler

and engine power, crusher, rolls, elevator, screens and steam jigs. There are four shafts sunk on the ground all of which entered the ore at an average depth of 160 feet. The ore is fair and very good productions are made. As the ground is somewhat open the drifts are cut only about twelve by fourteen feet.

GORMON, BLAIR & COMPANY.

This company, with Richard Gorman as manager, is opening up an excellent deposit of lead and zinc ore at a depth of 112 feet. The company is operating on the Regan land, and pay a royalty of twenty per cent on zinc ore. The dirt is hoisted by horse hoister.

PORTO RICO.

"Porto Rico" is the name given a new mining camp opened up two miles north of Duenweg and has the appearance of now becoming an ore producer which will command attention of those who are seeking new and profitable fields. The land contains 120 acres and is owned by Frank Porter, of Carthage, Mo., who has been leasing in blocks of six and two-thirds acres at a royalty of twenty per cent.

THE LUCKY TOM MINING COMPANY.

The "Lucky Tom" is the property of D. M. Stefford, Frank Stefford, Tom Pear, Ben Keen, James Johnson, Jene Bennett. Frank Porter, and Miss Eva Watkins, all of Carthage, Mo. This company began sinking a shaft down some months ago and struck a splendid body of lead and zinc ore at the depth of ninety-eight feet. The ore deposit being developed by this company is one of the richest in the district for new territory and it is our opinion that "Lucky Tom" will add fame to "Porto Rico" in her mineral productions. The water is lowered by a six-inch lift pump and a steam hoister is used for hoisting the dirt.

THE TROUP MINING COMPANY.

The Troup Mining Company is an incorporated company capitalized at \$160,000, and has Jas. H. Clark, of Indianapolis, Ind., as president and general manager, and C. F. Robinson, of Indianapolis, Ind., as secretary and treasurer. This tract of mineral land contains forty acres situated about two and one-half miles southeast of Webb City, adjoining the "Get There" on the south and "Eleventh Hour" mines on the east. The Troup is considered to be one of the best producers in the district. It having furnished for the market since 1890, more

than one-half million dollars worth of lead and zinc ore. There are three producing shafts on the land which is mined at about 175 feet below the surface. The ground is sufficiently hard to enable the miners to cut large drifts without the necessity of timbering. A pumping station is maintained by the company with sufficient pumps for the thorough drainage of the ground. The appended table will show the production of ores and total money value of same since 1891:

Year.	Pounds zinc.	Pounds lead.	Value.
1891.....	8,446,000	46,500	\$97,283 47
1892.....	13,414,000	498,000	153,526 85
1893.....	1,225,970	456,400	18,482 91
1894.....	3,401,810	803,110	42,421 13
1895.....	485,400	550,600	54,477 05
1896.....	446,700	271,300	38,464 60
1897.....	3,344,000	28,820	31,537 26
1898.....	3,570,400	144,500	37,972 00
1899.....	2,537,000	312,510	66,793 86
Totals.....	36,871,000	3,111,740	535,959 13

The pumping station maintained by this company is supplied with two boilers, sixty-five horse power each, one fifty horse power engine and one eight-inch Dean pump. Power is also furnished from this plant to run machinery of the concentrating plant which is equipped with a sixteen-inch crusher, two sets of eighteen-inch rolls, steam jigs, with a three cell rougher and a four cell cleaner, a Mundic separator steam hoister and elevators. Two lots are retained at this plant for the use of the company, the remaining lots being leased to operators on the royalty system.

The Standard Operating Company.

The "Standard" is the property of R. B. Dodge, of Webb City, C. F. Lefferts, of Council Bluffs, Iowa, W. E. Patten, of Prosperity, and others. The company is incorporated under the laws of Iowa and has a lease on seven lots of the Troup Mining Company's land. Prospecting began here in 1897 by sinking a shaft in which a good body of ore was developed at about the depth of 160 feet in hard ground. The company's new mill was completed in the fall of 1898, and since that time, this property has been producing well and adding very largely to the turn-in of the "Troup." Ore has also been developed by drill in a number of places on the lease and at about the same level the zinc

ore is being mined. The mill erected on this lease is supplied with one 100 horse power boiler, a sixty-five horse power engine, a fourteen-inch crusher, three sets of rolls, screens and elevators, steam jigs with a four cell rougher and five cell cleaner, steam hoister, a six drill air compressor and other necessities for a complete mill. There are about twenty men employed and the mines are under the management of W. E. Patten.

FRIEND, MITCHELL & LUKE MINING COMPANY.

This company has a lease on a sixty acre tract of mineral land about three miles southeast of Webb City, which belongs to the Regan heirs. The members of this company are R. C. Friend, J. A. Mitchell, J. A. Luke, all of Carthage, Mo., with Mr. Friend as superintendent. The company commenced operations last fall and has a number of shafts down to the ore bodies. The ground is sub-let to operators on the royalty system at twenty per cent. royalty. Ore was demonstrated by drill at the depth of eighty-five feet. The pump shaft is down 160 feet. The ground appears bouldery and requires some timbers for its support. The improvements here consist of two boilers, eighty-five and forty horse power, a thirty-five horse power engine, a steam hoister and an Aetna and a Cook steam pump with which the water is taken from the ground.

The O. M. & R. Mining Company.

This company has a sub-lease on four lots of the Regan land which was obtained of the Friend, Mitchell & Luke Mining Company, of Carthage, Mo., and is now managed by J. M. Biddle, of Carthage, Mo. The shafts have been sunk to the depth of 107 and 160 feet, respectively. In the deeper shaft a twenty-five foot face of lead and zinc ore was struck at 135 feet below the surface which continued as long as the work of sinking was in progress. The water is reported over the ore and no general work can be done until more effective drainage is had. The concentrating mill is equipped with one sixty-five horse power boiler and a thirty horse power engine, a fourteen-inch crusher, two pair rolls, sixteen and twenty-inch, elevators and screen, Johnson steam hoister with a four cell rougher and a five cell cleaner. Six men only are employed as the mill at present is doing custom work.

Long & Company.

This company is composed of E. Washburn, W. B. Sam. and A. J. Long, of Webb City, Mo. They have one lot of the "Gate City" lease

of the Regan land and are operating a twelve foot face of lead and zinc ore at a depth of 105 feet. The ground is hard and requires no timbers for its support. The improvements consist of a horse hoister and hand jigs and the output usually reaches from three to four tons of zinc ore and about 2,000 pounds of lead ore per week.

J. B. Rossland.

J. B. Rossland operates two lots of what is known as the "Jack 40" of the Regan land and has two shafts to the depth of sixty-six and seventy-six feet with faces of lead and zinc ore at from 4 to 12 feet. The dirt is hoisted with a horse hoister and cleaned on hand jigs. The production from this place is light as the ground is not opened up to work to advantage.

BEULAH C. MINING COMPANY.

The Beulah C. Mining Company is operating six lots on the ground of the Missouri Zinc Fields Company, the new company which bought the Chatham Mining Company's holdings. They have three shafts down with ore in two of them at 176 feet, the face being twenty feet high and 150 feet wide. They pay a royalty of twenty-two and one-half per cent on zinc and mine lead on the \$25 basis and with twenty-two men make an average weekly output of twenty-five tons of zinc ore. Robert Fouts, of Webb City, is the superintendent. A new and modern mill was erected and started in January, 1899, which is equipped with 100 horse power boiler, forty horse power engine, sixteen-inch crusher and three sets of rolls, elevators, screens and Freeman hoister in each shaft. The property was purchased in June, 1899, by the American Zinc, Lead & Smelting Company.

The Ozark Zinc Company.

The Ozark Zinc Company is an incorporated company composed of Springfield, Mo., parties with a paid up capital of \$10,000. The company is a newly organized one and have just completed a new sludge and tailing mill of very large capacity. They will use in the mill four Willfley tables with a capacity of one and one-half tons per hour each. Their plant has a boiler capacity of 150 horse power, with two sixty horse power and one forty horse power engine, and their tailing mill is equipped with the very latest improved machinery to economically handle a very large amount of rough stuff. The company has purchased the right to clean the tailings on the Eleventh Hour ground at Carterville. The officers of the company are R. P. Halderman, presi-

dent; H. H. Hughes, vice-president, and F. P. Clements, secretary, all of Springfield. L. L. Smith is the superintendent.

O'Neal & McDermott.

The members of this company are Charles O'Neal and John McDermott, of Webb City, Mo. They are operating two lots of the Missouri Zinc Fields land and have large faces of high grade ore developed for their elegant new plant which has just been completed at a cost of \$6,000. This concentrating plant is one of the most complete in the district and is equipped with an eighty horse power boiler, sixty horse power engine, a double eleven-inch crusher, three sets of rolls, two twenty-four-inch and a pair of chat rolls, revolving screens, elevators, steam jigs with five cell rougher and six cell cleaner and steam hoist. The mill has a capacity of 150 tons per day.

Arkansas Mining Company.

This mine is located just southeast of Webb City on the land of the Missouri Zinc Fields Company, and is owned by Edward and William Robinson, of Webb City, Mo. They have two lots leased with one shaft down to a depth of 140 feet and another in process of sinking. A large and rich face of ore has been developed at the 120 foot level from which twenty-five to thirty tons of zinc ore is hoisted weekly and prepared for the market. They employ fifteen men and have a complete concentrating plant equipped with sixty horse power boiler, thirty-five horse power engine, ten-inch crusher, two sets twenty-inch rolls, steam jigs with three cell rougher and five cell cleaner, three elevators and revolving screens, and a steam hoister. W. W. Wampler, of Webb City, is the superintendent.

Mizpah Mining Company.

The "Mizpah" is the property of Corum, Merrell & Company of Massachusetts, who recently purchased it of the Morning Star Mining Company. The company controls six lots located on the Missouri Zinc Fields Co.'s land situated just to the southeast of Webb City and has four shafts to a depth of from 165 to 190 feet. For years this property has produced well, but the present operators have developed in two of their shafts, more extensive and richer deposits of ore than has been heretofore shown from which very large and profitable productions are made. The small milling capacity caused the company to begin the erection of a 125 ton concentrating plant costing about

\$7,000 and which was put in operation September 1. This plant is equipped with one eighty horse power boiler a sixty horse power engine, a fourteen-inch crusher, two sets of rolls, elevators, steam jigs, steam hoister and one pump. The company is also erecting a large and complete tailing mill supplied with all the necessary machinery and modern improvements for successful work. The mines are under the management of A. Maness, of Webb City, Mo.

E. M. Dickey.

The Dickey property embraces four lots of the Missouri Zinc Fields Company's land and is owned by E. M. Dickey, of Dubuque, Iowa. These lots are subject to a royalty of twenty-two and one-half per cent on zinc ore while the lead is purchased by the land owners on the \$25 basis. Two shafts have been sunk to a depth of 165 feet, from which level very fair ore faces are being mined. The ore occurs in open ground which requires timbering for the support of the drifts. There are fifteen men given employment to each shift and the production reaches about 40,000 pounds of zinc and from 8,000 to 10,000 pounds of lead ore per week. The improvements consist of a concentrating mill supplied with a forty horse power boiler and a thirty-five horse power engine, a twelve-inch crusher, one set of rolls, steam jigs, elevators, steam hoister and a four-inch discharge steam pump. Frank Dickey, of Carthage, is superintendent.

Thos. Lively.

Thos. Lively, of Webb City, Mo., controls one lot of the Missouri Zinc Fields Company's land and has one shaft down to 165 feet at which level a face of zinc ore has been developed, but on account of strong water he is not operating the mine. He has a concentrating plant supplied with the necessary boiler and engine power, crusher, rolls, elevators, steam jigs, steam hoister, etc. The plant will be used for custom work until the ground is properly drained.

GATES CITY MINING COMPANY.

The Gates City Mining Company is composed of Iowa capitalists who have a lease of sixty acres of the old Keller ground southeast of Carterville, running twenty years at ten per cent. J. D. Rand, Felix M. and H. R. Hughes, of Keokuk, Iowa, are among the principal stockholders. The company is at present engaged in prospecting the ground and only employ a small force. L. A. Fox is the superintendent of the ground. There are three shafts in ore, two of them at 130

feet and the other at 204 feet. They have at present only a pumping plant with sixty horse power boiler and drain the ground with a four-inch discharge Snow pump. They will build a complete mill in the near future.

CHARLES A. PARKER & COMPANY.

The company is composed of Charles A. and Thomas A. Parker, of Webb City, Mo., Ed. Nelson and Miles Deer, of Joplin, Mo. They are operating on land owned in fee simple by A. G. Carter, of Webb City, Mo., about two miles southeast of Webb City and adjoining the McKinley mines on the east. They have three lots each 200 feet square with a shaft down eighty-one feet from which a drift is being cut on a large and very rich body of lead ore. With a horse hoister and two hand jigs the productions reached about fifteen thousand pounds of lead per week, while opening the drift. This production will be very materially increased as the mine is opened and additional jigs put in place for cleaning ore.

THE ORONOGO DISTRICT.

The Oronogo mining camp is situated three miles north of Webb City and has become famous in the past two years for the large number of its mines producing high grade ore. This camp has the distinction of being the oldest mining camp in Jasper county, but it has only been within the last two years that the lower deposits of zinc ore have been worked and to-day this historic old camp presents the greatest activity ever known to the oldest inhabitants and in fact the greatest known in mineral district of Southwest Missouri, when we take into consideration the comparatively small area worked. Only a little over two years ago the mining industry of this entire section was unsettled and suffering very greatly from the general business depression throughout the country, and at that time the Oronogo was one of the dullest looking mining camps in the country, giving no promise of its present great development, but with the general business revival which gave new life to the mining industry, Oronogo began to uncover her enormous deposits of zinc ore and has shown to the world some of the richest zinc mines in existence. The land on which most of the producing mines are located is owned by the Granby Mining & Smelting Company and is under the management of M. L. Downing, of Joplin, the company leasing lots on the royalty system. The operators at this camp, mention of which is made below have large and complete con-

centrating plants and the advantage of the St. Louis & San Francisco Railway for the transportation of their ore.

The P. E. Mining Company.

The P. E. Mining Company, operating five lots of the Granby land, is composed of eastern gentlemen who recently purchased the property from A. G. Carter, George W. Ball and others of Webb City. Prospecting on this ground commenced in 1897, and the ore production dates from the early part of 1898, since which time this mine has taken the lead among all the splendid producers at Oronogo. The ore is found at about 130 feet from the surface in hard ground, requiring no timbering for its support. The production of zinc ore runs from sixty to eighty tons per week. The improvements on the P. E. lots consist of a modernly built concentrating plant, equipped at a cost of about \$4,500 with two boilers aggregating eighty horse power, one fifty-five horse power engine, a fourteen-inch crusher, three sets of rolls, one ten-inch and two twenty-four-inch, steam jigs with four cell rougher and five cell cleaner, screens, elevator, steam hoister and an eight-inch lift pump. The mine is still under the management of Geroge Ball, one of the original owners.

The Nugget Mining Company.

The Nugget Mining Company operates four lots of the Granby land on the "Big Circle" lease and the property was recently sold by the owners, M. R. Lively, of Webb City, and the estate of L. S. Allison, of Hazleton, Pa., to eastern parties. There are two shafts down 145 feet in hard ground which allows drifts of large size to be cut with perfect safety without timbering. The company is cutting on a very rich face of lead and zinc ore about thirty feet high with ore still in the bottom of drift. The ore is high grade and sells for the highest market price. The production reaches from twenty to forty tons of zinc ore per week, and as high as 30,000 pounds of lead ore. There is a complete concentrating plant costing \$4,500, equipped with forty horse power boiler, thirty-five horse power engine, twelve-inch crusher, three sets of rolls, steam jigs with four cell rougher and five cell cleaner, elevators, screens, and a steam hoister. The mine has been opened up only about a year, but in this short time it has made a phenominal record among the big producers of the district.

Little Blanch.

The Little Blanch Mining Company has a lease of four lots on the Granby land, with two shafts down to a depth of 140 feet. The pres-

ent owners of the Little Blanch are eastern gentlemen, who recently purchased the property of W. E. Magruder and others of Webb City, Mo. Like most other mines at this camp, the ground is hard and does not require timbering. The company has opened up a very large face of zinc ore which insures profitable mining, they employ about twenty men and make a weekly production of about sixty thousand pounds of zinc ore which is of a very high quality. The machinery consists of a complete concentrating plant supplied with a sixty horse power boiler, forty horse power engine, fourteen-inch crusher and three sets of rolls, steam jigs with four cell rougher and five cell cleaner, steam hoister, elevators and screens.

Cass & Company.

This company is composed of A. A. & W. W. Cass and M. V. Jones, of Carterville, Mo., and Thomas Morgan and A. L. Johnson, of Muncie, Ind. This company has three lots leased of the Granby company and have developed a very large body of ore at a depth of 135 feet from the surface. The ground is hard and the ore is of a very high quality. The company employs about sixteen men and make regular and profitable weekly turn-ins of ore. The improvements consist of an up-to-date concentrating plant, costing about \$4,000, equipped with an eighty-five horse power boiler, forty horse power engine, steam jigs with four cell rougher and five cell cleaner, sixteen-inch crusher and two sets of extra large rolls, elevators, screens, steam hoister and small pump. W. W. Cass, of Carterville, Mo., has charge of the plant.

The Aurora Mining Company.

This company is composed of Al. Tuttle and I. A. Cottingham, of Aurora, Mo., G. L. White, of Oronogo, and A. A. Cass, of Carterville, Mo. This company has a lease on two and one-half lots of the Granby land which was sub-leased of Dermott & Gunning. Three drifts have been cut showing an immense quantity of zinc ore. The ore is found at the 140 foot level in hard ground and is of a very high grade. About twenty men to each shift are employed at the Aurora, making the total number employed forty, when running double shifts. The machinery consists of a complete concentrating plant which cost about \$4,000. The plant is equipped with a seventy horse power boiler, forty horse power engine, fourteen-inch crusher with three sets of rolls, thirteen, eighteen and twenty-two-inch, steam jigs with four cell rougher and six cell cleaner, screens, elevator and steam hoister. This property is under the management of G. L. White, of Oronogo.

The Big Circle Mining Company.

This company is incorporated and is composed of W. G. Corothers, of Fairfield, Ill., J. B. Swift, of Cincinnati, Ohio, J. A. Meeks, C. A. Wachtell, R. M. Ball, M. G. and R. H. Branch, A. M. Wagner, H. C. Klein and W. H. Moreland, of Muncie, Ind., C. W. Reinhart, of Carthage, Mo., and H. G. Sample, of Webb City, Mo., the latter being superintendent and manager of the property and Mr. Reinhart, president. The company is operating five lots of the Granby land at Oronogo at a royalty of twenty per cent on zinc ore. Three lots are worked at the 155 foot level, where good bodies of ore have been developed in hard ground, requiring no timbering. The ore from this mine is of high grade and brings the top price. The company employs about twenty men and their improvements consist of a concentrating plant, equipped with an eighty horse power boiler, sixty horse power engine, steam jigs with five cell rougher and six cell cleaner, fourteen-inch crusher and three sets of rolls, one ten by fourteen and two sets fourteen by twenty-seven, elevator, screens, steam hoister, etc. The company operates two shafts, both producing.

La Tosca Mining Company.

This company is incorporated with a capital stock of \$40,000, the majority of the stock being held by eastern parties and the minority by Isaac Kahn and P. J. Wessell, of Monett, Mo. The company is operating six lots, leased at a royalty of fifteen per cent from the Granby Company at Oronogo, their lease expiring in 1907. There are three shafts sunk on this ground and the ore is being worked at about the 155 foot level and while the ore is not as rich as at some of the other mines on the Granby ground, the ore faces are extremely large, showing a large amount of profitable working ahead. Like all the other mines on the Granby ground, the ground is hard requiring no timbering. The regular turn-in of the company runs from 40,000 to 60,000 pounds per week. The improvements consist of a concentrating plant, equipped with large boiler capacity, eighty horse power engine, two steam hoisters, complete steam jigs with five cell rougher and five cell cleaner, fourteen-inch crusher and three sets of rolls, fourteen, nineteen and twenty-five-inch and a thirteen-inch pump, which drains the ground and furnishes water to run the plant.

The Gaddis Mining Company.

The Gaddis Mining Company is incorporated with a capital stock of \$10,000 and is composed of J. A. Gaddis, of Oronogo, Mo., and Mr.

Mosher, of New York. The present company recently purchased the interests of John Dermott, of Webb City, and William Gunning, of Oronogo, and operates three lots leased of the Granby Company at a royalty of fifteen per cent. They are working a very large and rich face of high grade ore at a depth of 125 feet in the hard ground characteristic of this mining camp. They are working at the top of the ore run and are making regular turn-ins. This is one of the best mines at Oronogo, and has apparently a long and profitable run before it. The improvements consist of a complete concentrating plant, equipped with a 110 horse power boiler, sixty horse power engine, twelve-inch crusher and three sets of rolls, ten, twenty-two and twenty-four-inch, steam jigs with rougher and cleaner each of six cell capacity, elevator, screens and steam hoister. The mines are under the management of Mr. Gaddis.

The Sunshine.

The Sunshine mine is the property of L. D. Hare, Mrs. J. O. Munson, R. M. Keyes, and W. T. McGehee, of Webb City. The company sub-leased two lots on the Granby land from the Bunker Hill Mining Company at a royalty of twenty-five per cent. There was a fairly good run of ore at fifty feet from which an average turn-in of ten tons per week was made when the mines was first opened, but through careless work while cutting for air, the drift was caved and has not since been worked. The pump shaft has been sunk to a depth of 106 feet, but the best ore is below this level and the shaft will be sunk still deeper. The only work done for several months past has been prospect work. The mine has a complete concentrating plant with sufficient capacity to handle all the dirt hoisted, but is has been idle since the suspension of active operations.

Bunker Hill Mining Company.

The Bunker Hill Mining Company is incorporated with a capital stock of \$14,000, with the following officers: William Stringfellow, St. Joseph, president; C. W. Reed, Oronogo, vice-president; W. B. Shackelford, Webb City, secretary and treasurer. The other members interested are James Means, C. L. Perrin, H. H. Perrin, H. H. Tartar, L. H. Bullard, Thomas T. Whitney and Horace Fuller, of Boston, Mass., and C. W. Sponsler and W. D. Rusk, of St. Joseph, Mo. This company has a lease on eleven lots of the Granby land at Oronogo at a royalty of fifteen per cent. A sixty-five foot face of high grade ore has been developed at a depth of 135 feet. The mill was started

in November, 1897, and since that time the Bunker Hill has produced a large amount of very high grade ore. The company has a complete concentrating plant erected at a cost of \$6,500, equipped with two eleven-inch lift pumps, and a five-inch Worthington steam pump, two eighty horse power boilers, two engines, one a forty-five horse power to run the mill and another engine for the pumps, steam jigs with five cell rougher and six cell cleaner, fourteen-inch crusher with three sets of rolls, elevators, screens, etc. The company employ eighteen men and have been making a steady output of about twenty-two tons weekly, but will greatly increase this in the near future.

Oronogo Sludge Company.

This company was incorporated in April, 1899, with a capital of \$16,000 and absorbed the Mays & Daniell Sludge Company. The officers of the company are Geo. W. Ball, president; C. A. Braley, vice-president; M. L. Downing, secretary and treasurer. The other members of the company are William Gunning, C. H. Hammett, John and Harry Stephens, Frank Geer, Ed. Magruder, J. A. Davis and J. C. and B. F. Mays. The company own the new sludge mill erected by Mays and Daniells in March, 1899, which in the nine weeks prior to June 30, 1899, turned in 991,040 pounds of cleaned ore which sold for \$9,871.05 and they have in course of erection a new mill to cost about \$13,000, which will have a capacity of 400 tons of tailings every twenty-four hours. They have boiler capacity at the new mill of eighty horse power and a forty-five horse power engine and will maintain in addition, a pumping station on Centre Creek to supply the new mill with water, the pumping station being equipped with a sixty horse power boiler and a five-inch Snow pump.

The Texas Star.

The Texas Star Mining Company is composed of W. E. Simpson and S. W. Summers, of St. Louis; James Ellior, McAlister, Ind. Ter., and B. J. Dennison, Joplin, the latter being superintendent and general manager. They have a lease on forty acres of the Mose Elliott land and on twenty acres of the Granby land at Oronogo, on what was formerly known as the "Needmore" tract and on which ore in large quantities was mined several years ago, but on which work was suspended on account of the low prices for ore prevailing at that time as well as on account of the cost of pumping. Their machinery at present consists of a pumping plant equipped with a five-inch Snow discharge pump and an eight, seven, twelve, five-inch Snow

duplex pump. The pump shaft is 110 feet deep and the water is now down to the eighty-five foot level. Their pumps have a capacity of about 2,000 gallons per hour, and since they were started in March they have thrown about seventy-five million gallons. The whole sixty acres are platted and eighteen shafts are going down on the ground in which ore was found at from thirty-five to 100 feet. Seven drill holes were put down on the land before the present company leased it and ore was developed in all of them from 160 to 200 feet. A new 100 ton mill has been contracted for and the company will do custom work for their sub-lessees as soon as it is completed.

CENTRE VALLEY LEAD & ZINC COMPANY.

The Centre Valley Lead & Zinc Company owns a lease running twenty or twenty-five years on a tract of 298 acres of land lying along the Centre Creek bottoms between Webb City and Oronogo. The land under lease to this company is owned in fee simple by U. Hendrickson, of Oronogo, A. H. Baker, of Carthage, Mo., A. G. & S. E. Carter, of Webb City and S. H. Hockaday, of Webb City. The company was incorporated in 1897 under the laws of Missouri with a capital of \$100,000, the shares numbering 1,000 at a par value of \$100 per share. Lead was known to exist and float lead was picked up on the land by farmers for a generation before any attempt was made to mine the ground. Prospecting on this land was first commenced by Grant Ashcraft, of Webb City, Mo., who mined it for shallow lead and produced several million pounds of the ore. Later it was found to be rich in zinc ore as well as lead ore, but the zinc was found at a much greater depth and the battle against strong water commenced. An enormous amount of money was expended in an effort to drain the ground to the zinc ore level, but real success was not attained until after the present company began to operate the land and installed the powerful and efficient pumping system now in operation so successfully. Ore bodies of great extent have been developed, ranging from a few feet below the surface to a depth of 147 feet, to which level, pump shaft number 1 was sunk. Very rich zinc ore remains in the bottom of this pump shaft and if an efficient drainage system continues to be maintained, there can be no question about the great future before this great tract of mineral bearing land. Heretofore mining operations have been mostly confined to forty acres, but new energy and life are now seen on all sides. Up to the present time there has been mined and sold, something like 9,000,000 pounds of lead and 2,000,000 pounds of zinc ore. The company maintains three regular pumping stations

besides a number of pumps in other shafts and use about 600 horse power boiler capacity and engines of 150 horse power, to run their pumps. The output of ore from the ground is increasing right along and now reaches upward of 200,000 of zinc ore weekly in addition to the lead. The ground is mostly hard and the expense of timbering is light. The officers of the company are as follows: Louis Duenweg, president and treasurer; Willard Kidder, vice-president; I. T. Robinson, secretary and superintendent; O. E. Duenweg, assistant secretary and assistant treasurer. Directors—Louis Duenweg, Willard Kidder, B. G. Hognet, O. E. Duenweg, Mr. Johnson, A. J. Steen, I. T. Robinson.

Silver Dick Mining Company.

The Silver Dick property is owned by O. E. Duenweg and W. M. Steen, of Terre Haute, Ind., and A. M. Johnson, of Cleveland, Ohio. The lease covers four lots of the Centre Valley Company's ground and is subject to a royalty of thirty-three and one-half per cent on lead ore and twenty-two and one-half on zinc ore. Two shafts have been sunk to a depth of 103 feet which entered the ore bodies at the eighty foot level. Three drifts are being cut, each about twenty-five feet wide and from twenty-five to thirty feet high, which show great bodies of zinc ore of unusual richness. The ground is hard and timbering is unnecessary for its support when the proper pillars are left. This mine is one of the greatest producers of high grade ore in the district, its output being from eighty to 100 tons per week, running double shifts with a force of forty-five men. The largest production for a single week at this mine was 130 tons. There is a complete concentrating plant her with two boilers, forty and eighty horse power each, an eighty horse power engine, fourteen-inch crusher, three sets of rolls, two twenty-four and one sixteen-inch, steam jigs with four cell rougher and six cell cleaner, revolving screens, elevator, steam hoister, etc. The mine is under the management of T. C. Jones, of Webb City, Mo.

Hawkeye Mining Company.

The "Hawkeye" is the property of V. L. Chester, J. E. Bell and O. L. Olive, all of Carthage, Mo., with Mr. Chester as manager. The company controls two lots on the Centre Valley Company's lease and has two shafts sunk to a depth of 100 feet which entered the ore body at forty-five feet from the surface. The work of sinking is now in progress and good zinc ore is hoisted from this working. Three drifts are being cut at the 100 foot level which were started six feet wide

the shaft, but were gradually widened until they are now twenty-five feet wide with good faces of zinc ore in each. The ground is hard and no timbering is required for the support of the drifts when the proper pillars are left. The company pays a royalty of twenty per cent, runs double shifts and gives employment to forty-two men and produces from thirty to sixty tons of high grade ore per week. The improvements on the Hawkeye ground consist of a complete concentrating plant, equipped with an eighty horse power boiler, forty-five horse power engine, sixteen-inch crusher, three sets of rolls, two twenty-four and one sixteen-inch, steam jigs with five cell rougher and six cell cleaner, revolving screens, fourteen-inch elevator, steam hoister and a four-inch discharge steam pump.

Howell & Crowley.

This company is composed of H. R. Howell, of Chicago, and Charles Crowley, with Richard Board, of Webb City, as superintendent. The company is operating two lots on the Centre Valley Company's lease and have a shaft down to a depth of 100 feet in which they went into ore at eighty feet from the surface. They have a twenty-five foot face of zinc ore from which they are producing twenty-five to thirty tons per week, with twenty men working single shifts. They pay a royalty of twenty-two and one-half per cent on zinc ore and thirty-three and one-third per cent on lead. The improvements consist of a concentrating plant supplied with an eighty horse power boiler, sixty horse power engine, fifteen-inch crusher, three sets of rolls, two twenty-four and one nineteen-inch, steam jigs with five cell rougher and six cell cleaner, elevators, steam hoister, etc.

Charles Stertevant & Company.

This company is operating four lots on the Center Valley Mining Company's lease and has two shafts sunk to a depth of eighty feet. The company is working an ore face ten by twelve just opening up sufficiently to operate to advantage. The ground is just hard enough to admit of drifts of reasonable width being cut without timbering. A concentrating plant has just been completed at this mine, equipped with two portable boilers of twenty-five and fifty horse power, forty horse power engine, twelve-inch crusher, two sets of rolls, sixteen and nineteen-inch, steam jigs with four cell rougher and five cell cleaner, steam hoister, screens, elevator and a 10-6-10 Worthington steam pump. The property is under the management of Charles Stertevant, of Webb City.

THE NARRAGANSETT LEAD & ZINC COMPANY.

The Narragansett Lead & Zinc Company is operating a 100 acre lease of the John C. Guinn land just north of Webb City. The company is incorporated under the laws of West Virginia with a capital of \$150,000, fully paid up. The officers of the company are, Portal M. Black, Lawrence, Mass., president; F. J. Rider, Lawrence, vice-president; Chas. A. Clark, Newton Centre, Mass., treasurer; M. D. Currier, secretary; Frederick J. Hart, of Webb City, Mo., resident manager. The land has been fairly well prospected with the steam drill which developed good bodies of ore. Operations were commenced in March, 1898, and for a long period, pumping was about the only work attempted, but at this time the ground is very well drained and good progress has been made toward uncovering the existing ore bodies. The company has a complete and powerful concentrating plant equipped with boilers of 200 horse power and a sixty-five horse power Atlas engine with the other machinery found in all modern plants, including large crusher, three sets of rolls, steam jigs with five cell rougher and six cell cleaner, steam hoister, elevator, screens, etc. The pumping plant consists of three ten-inch Cook pumps with a capacity of 650 gallons per minute and a Snow duplex pump with a capacity of 1,000 gallons per minute. The pumping plant was run to its full capacity to lower the water to the working level, but as soon as this was accomplished the Snow pump was all that was needed to hold it. Both lead and zinc ore are found from 120 to 170 feet. The ground is moderately hard and is easily held and is well located between the Centre Creek Company's ground and the Centre Valley and Oronogo mines and from the work already done there is every indication that the production will be greatly increased as soon as the ground is thoroughly opened up. The company employs twenty-five men and also sub-leases lots to miners at a royalty of twenty-two and one-half per cent on zinc and twenty-five on lead ore. Several lots have been sub-leased and considerable prospect work is being done by the sub-lessees.

NECK CITY AND ALBA DISTRICT.

The Neck City and Alba Districts are now among the most promising in Jasper county, and there is no longer a question as to the

enormous and rich bodies of mineral existing. This fact has been fully demonstrated by the many shafts and drill holes put down. Rich zinc ore has been penetrated at from points near the surface by shaft or drill to the depth of 300 feet, showing conclusively that great and almost inexhaustible bodies of mineral exist. There are to be seen at these mining camps now, mining improvements from the primitive windlass to the most complete and modern concentrating plants in the southwest. The increase in population has kept pace, of course, with the extensive mineral developments and to-day bright and bustling little cities are to be seen. The only disadvantage surrounding these camps that we can see, is the lack of railroad facilities. The ore must be hauled to points on the Frisco railroad six miles distance for shipment, but this disadvantage is slight as the cost of the overland haul is only eighty-five cents per ton. These mining camps are situated about eight miles north of Webb City and about twelve miles northwest of Carthage, being near Spring River and North Fork. Following, we mention a few of the operators of the Neck City and Alba camps.

BALL LAND & MINING COMPANY.

This company is incorporated under the laws of Missouri and is capitalized at \$16,000, fully paid up, with Thos. Morgan, of Muncie, Ind., president, and H. C. Lisch, of Oronogo, Mo., secretary and treasurer. The company owns in fee simple thirty-seven acres of mineral land situated near Neck City which they have leased to the Rubber Neck Mining Company. This company operates six lots which are sub-leased from the above company and has two shafts sunk; one to the depth of 220 and the other to the depth of 237 feet, with large and rich deposits of both lead and zinc ore developed in each. An eighteen foot face of ore is being mined, but the shafts are reported to have shown a thirty foot face at these levels. Insufficient water at 237 feet to operate the mill which caused the company to drill the shaft to the depth of 300 feet. The drill struck another ore deposit at 260 feet and continued in it to the full depth of hole, showing a lower run of mineral of forty feet. The ground is hard enough that timbering is unnecessary for the support of the drifts if properly cut. This mine makes a weekly production of from fifty-six to seventy-three tons of high grade zinc ore with twenty-two men employed at single shift work. A royalty of fifteen per cent is paid, but as the company owns the land in fee simple, seven per cent of this royalty is returned as per terms of lease given the Rubber Neck Company. This is one

of the richest mines in the district and on account of the great body of mineral penetrated near the 300 foot level, it would be most difficult to predict the end of profitable mining. The company has also a very rich lead deposit at the eighty-five foot level, from which deposit there were 19,000 pounds taken out in one shift of nine hours. The improvements here consist of a complete concentrating plant erected at a cost of \$8,500, equipped with two boilers, one fifty and one eighty horse power, a sixty-five horse power engine, one fourteen-inch crusher, two sets of twenty-four-inch rolls and one sixteen-inch, a five cell rougher and a six cell cleaner, steam jigs, one revolving screen, three elevators, three steam hoisters and two four-inch discharge Snow pumps.

SPRING RIVER MINING COMPANY.

The "Spring River" is situated one mile south of Alba and is the property of A. L. Garford, of Elyria, Ohio. The property is under the management of Mr. E. E. Williams, whose local residence is at Webb City, Mo., with P. A. Noble as superintendent. The lease embraces of mineral land, twenty-five acres, twelve and one-half acres being at a royalty of eight per cent with nineteen years to run, and twelve and one-half at a royalty of ten per cent with about sixteen years of unexpired time. The lands are owned in fee simple by Daniel Fox and W. Honey, of Alba, Mo. These mines are among the largest producers of the district and have yielded handsome dividends to the owners. There are five completed shafts sunk on the land and two in course of sinking. Those completed range in depth from 180 to 207 feet with extensive ore bodies developed in each. The ore is developed and mined in some of the shafts at from 165 to 170 feet, while it is mined at the 200-foot level in others. About an average of a thirty-foot face of zinc ore is being mined, yet rich zinc ore is to be seen in bottom of drifts and shafts. The company operates two mills, while two others which are owned by the company are operated by lessees. The "New Fox" mill is operated by this company and is complete in all its parts, being equipped with one eighty horse power boiler, one fifty horse power engine, a fourteen-inch crusher, two sets of twenty-two-inch rolls, steam jigs with five cell rougher and six cell cleaner, three elevators, screen, steam hoister, one four-inch discharge Worthington pump, a Stillwell heater and skimmer. With fourteen men employed, the mill concentrates from twenty to twenty-five tons of zinc ore per week at single shift work. The ore occurs in medium ground which requires some timbering for the support of the drifts.

The Honey Mill is also operated by this company and gives employment to fourteen men. They are cutting on a thirty foot face of zinc ore and produce about thirty tons per week. The concentrator here is supplied with an eighty horse power boiler, a fifty horse power engine, one twelve-inch crusher, two sets of twenty-inch rolls, a four cell rougher and a five cell cleaner, steam jigs, elevators, screens and steam hoister. The working level at this plant is from 165 to 170 feet below the surface in open ground which requires some timbering.

The Pump Mill.

This mill is owned by the Spring River Company, but is leased together with two lots to McDonnell & Company, of Carterville, Mo., at a royalty of thirty-three and one-third per cent on all minerals mined. This mine is being worked at the greatest depth of any on the Spring River leases. A very rich and extensive ore face has been opened and is being worked at the depth of 207 feet with excellent ore yet in bottom of the shaft and drifts. Like the other mines on this lease, the ground is open, yet very little timbering is necessary where the drifts are properly cut. There are from twelve to fifteen men employed and the production reaches about forty tons per week of high grade zinc ore. The improvements here consist of a complete concentrating and pumping plant, equipped with three boilers, two forty and one 120 horse power, two engines, one fifty and one eighty horse power, a fourteen-inch crusher, two sets of twenty-two-inch rolls, steam jigs with a five cell rougher and a six cell cleaner, screen, elevators, four pumps, two fourteen-inch and two five-inch discharge Snow steam and a steam hoister.

F. M. Sponable.

F. M. Sponable, of Alba, Mo., operates two lots of the Spring River lease and has two shafts sunk to a depth of 190 feet in open ground with good deposits of zinc ore developed in each. He pays a royalty of twenty-five per cent to the Spring River Company, employs from twelve to fifteen men and produces from twenty-five to thirty-five tons of zinc ore per week. The ore faces here are being cut from forty to fifty feet high. The ore is hauled a distance of about four miles to the Mansur Station on the Frisco, for shipment. He has a concentrating mill supplied with a fifty horse boiler and thirty-five horse power engine, two sets of rolls, one fourteen-inch crusher, elevators, screen a four cell rougher and a five cell cleaner, steam jigs, and a steam hoister.

OAKDALE MINING COMPANY.

The Oakdale lease contains 157 acres of mineral lands belonging to the Smith estate and is leased to above company for a term of years at eight per cent on sixty acres and ten per cent royalty on ninety-seven acres, on all minerals mined. The land is situated about one mile southeast of Alba, and the mineral is hauled over land a distance of about four miles to Mansur, from which point it is shipped over the Frisco railway. The lease was the property of L. S. Allison, of Hazelton, Pa., who was accidentally killed in one of the shafts about the first of last March. The ground is known to be rich in mineral, but owing to strong water and other causes, the production has been light. There was a complete pumping and concentrating plant on the lease, but it was burned down a short time ago. We are not informed as to whether or not operations will be resumed by this company or not. The property is being managed by J. J. Henderson, of Webb City, Mo.

PHINX MINING COMPANY.

The Phinx Mining Company is incorporated under the laws of New Jersey and capitalized at \$70,000 with W. J. V. Stokes, of Trenton, N. J., president; C. A. Daniels, of Philadelphia, secretary and treasurer, and J. B. Daniel, of Webb City, Mo., general manager. The company has a ten year lease on a tract of mineral land at a royalty of ten per cent, situated at Neck City and about eight miles north of Webb City, which is owned in fee simple by the Calumet Zinc Land Company and the T. A. Kelsey estate, and comprises thirty-two acres. Mining is done at about the 100 foot level in medium hard ground in which rich deposits of zinc ore exist. Zinc ore has been demonstrated by drill at several different points on the lease at about the same level of the present operations which proves that the ore bodies at this level are extensive. The company has erected a new and complete concentrating plant, equipped with sufficient boiler and engine power, a fourteen-inch crusher, rolls, elevators, screen, steam jigs, steam hoister and pumping capacity sufficient to drain the ground.

Calumet Zinc Land Company.

This company is operating a sub-lease secured of the Phinx Mining Company, and has four shafts down, ranging in depth from 100 to 200 feet with good bodies of zinc ore developed in each shaft at

different levels. The ore is of a high grade quality and occurs in medium hard ground, the deposits ranging in thickness from eight to thirty-five feet. As the lower runs of ore are penetrated by these shafts they become better in the quality of the ore and more extensive in size, and there are now sufficient developments to insure lasting and profitable mining. The developments are all new and a 100 ton concentrating plant will be erected immediately. The Calumet company owns the land in fee but pay a royalty to the Phinx of twenty per cent, receiving in return the land royalty which is ten per cent. The company is incorporated under the laws of Missouri with L. H. Parker, of Beloit, Wis., as president; A. E. Smith, vice-president, and G. L. Cole, of Neck City, secretary and treasurer.

Neck City Real Estate Company.

This company is incorporated under the laws of Missouri and capitalized at \$20,000 with E. F. Boles, president, and G. L. Cole, secretary and treasurer, both of Neck City, Mo. They are operating a tract of mineral land containing thirty acres, situated at Neck City and have two shafts sunk, one to fifty and the other to the depth of 100 feet with lead and zinc ore developed in each. Each of these shafts were drilled and a good body of zinc ore penetrated at the depth of 160 feet. This development is also new, but will soon become profitable as the ore encountered is apparently in large quantities.

THE RUBBER NECK MINING COMPANY.

The "Rubber Neck" is situated near Neck City and is composed of Robt. and M. Branche and others of Muncie, Ind. The company is operating four lots at a royalty of fifteen per cent, of the Bailey lease, secured of the Ball, Land & Mining Company who own the land in fee simple. They have two shafts, one to the depth of 212 and the other to the depth of 225 feet. Zinc and lead ore were developed at 125 feet below the surface, but mining is being done at the 200 foot level on dirt that will run about ten per cent lead and zinc ore. The ore occurs in open ground which requires some timbers for the support of the drifts. There are about twenty-two men given employment and the production reaches from thirty to sixty tons of zinc ore and from 12,000 to 40,000 pounds of lead ore per week. Their improvements consist of a complete concentrating plant, equipped with an eighty and a forty horse power boilers, one fifty horse power engine, a fourteen-inch crusher, two twenty-four and one fourteen-inch set of rolls, steam jigs with a four cell rougher and a five cell cleaner, four

elevators, screen, two steam hoisters and two eight-inch lift pumps with which the ground is drained and general milling purposes. The mines are under the management of Minor Branche, of Webb City.

M. & I. Mining Company.

This property belongs to Muncie, Ind., people and is located on the Bailey lease. They control four lots and have two shafts sunk, one to seventy and the other to the depth of 130 feet, both of which have developed lead and zinc ore in open ground, but lead is the principal production as the shafts are not deep enough for the better bodies of zinc ore. Their improvements consist of a steam hoister and four hand jigs, and the production reaches about 20,000 pounds of lead ore per week.

Prigmore.

Thos. Prigmore, of Neck City, Mo., controls two lots of the Bailey lease and has two shafts sunk to the depth of eighty feet with lead and zinc ore developed in one shaft in open ground. His ore is cleaned over hand jigs and a weekly production is made of from three to four tons of zinc and about 2,000 pounds of lead ore per week.

PLEASANT VALLEY MINING COMPANY.

The Pleasant Valley Company is composed of H. N. Cornell, of Carthage, Mo., and eastern gentlemen who recently purchased the interest of John Dermott, of Webb City, Mo. These mines are located on a tract of mineral land containing forty acres and situated about three miles southwest of Carthage. Two shafts are being operated, one at fifty feet and the other at near the 200 foot level. The ground is hard and the ore occurs in the sheet formation. There are from twenty to thirty men who find employment at these mines and the production reaches from thirty to fifty tons of high grade zinc ore per week, on which a royalty of ten per cent is paid. The improvements consist of a complete mill, supplied with two eighty horse power boilers, one seventy-five horse power engine, two twelve-inch crushers, four sets of rolls, one ten-inch and three sets of twenty-two-inch, steam jigs with rougher and cleaner, elevators, screen, two steam hoisters, one seven-inch discharge Worthington and a five-inch discharge Hooker pump, office and scales. The mines are under the management of H. N. Cornell, of Carthage, and the advantage of the Mo. Pac. Railway for transportation.

LEOTA MINING COMPANY.

The "Leota" is composed of C. W. and G. W. Whitsell and Ed. Hannum, of Carthage, Mo., S. Burkhead, of Lancaster, Mo., L. M. Biddle, O. M. Cole, S. Boutan and Mr. Bradshaw, of Centerville, Iowa. They operate six lots leased at a royalty of fifteen per cent of lands owned in fee simple by I. Blankenship, of Carthage, Mo., and is situated two and one-half miles southwest of Reeds Station on the Frisco, from which point the mineral is shipped. Five shafts have been sunk ranging in depth from thirty-five to 124 feet with the best developments had at the seventy-five foot level in hard flint ground, but ore was developed in each shaft. The ground carries lead, zinc and silicate ores. The lead occurs at from thirty-five to forty feet below the surface, while the zinc ore exists from forty feet down. These mines are new and are located in a new territory and we are inclined to the belief that at an early date, very active and profitable mining will be seen here. The company has just completed a crusher plant, supplied with sixty-five horse power boiler and a thirty-five and a twelve horse power engines, one fifteen-inch crusher, two sets of rolls, eighteen and twenty-four-inch, a steam hoister and one nine-inch lift pump. The ore will be cleaned on hand jigs and about twelve men given employment. The mines are under the management of G. W. Whitsell, of Carthage, Mo.

Whitsell & Bennett Mining Company.

This company is composed of C. W. Whitsell, Frank Bennett, J. M. Biddle, and S. Burkhead, who are operating a lease comprising five acres of mineral land situated two and one-half miles southwest of Reeds Station, of lands owned in fee simple by W. E. Eells, of Reeds, Mo., to whom a royalty of ten per cent is paid on all minerals mined. Two shafts have been sunk, one to fifty-six and the other to a depth of sixty-two feet. The ground carries lead, zinc and silicate ores, but the silicate is the principal ore mined at present, which appears to be immediately above the zinc ore. The company gives employment to fourteen men and makes a production of about thirty tons of silicate per week, which is a very good production when we consider that only two horse hoisters are used for hoisting the dirt which has to be hauled some distance and cleaned on hand jigs. The ore occurs in open ground which requires timbers for the support of the drifts. The mines are under the management of G. W. Whitsell, of Carthage, Mo.

CAVE SPRINGS DISTRICT.

CAVE SPRINGS.

Cave Spring camp is situated about six miles west of Joplin, near the state line. Like many other localities in Jasper county, this camp has grown from a dormant state to a mineral producing camp of considerable magnitude in the past two years. It is situated on the Kansas City, Ft. Scott & Memphis railroad over which line the mineral is shipped to market. The town is filled up with progressive people who have well earned the success attained.

Following we mention some of the operators at Cave Springs:

The Eureka Mining Company.

This company has nine lots leased on land owned in fee simple by W. E. Brinkerhoff and Jos. Heran, of Carthage, Mo., and is composed S. J. O'Neill, G. W. Wheatly, H. Corning, J. W. Wampler, with Mr. O'Neill as manager. They pay a royalty of ten per cent and charge operators twenty per cent on zinc ore while the lead is mined on the \$28 basis. The company only does a sub-leasing business. There are three shafts on the lease ranging in depth from 115 to 138 feet in hard ground which does not require the use of timbers for the support of the drifts when properly cut. Ore has been developed in all three shafts with an average ore face of from fifteen to twenty feet. The following are some of the operators on the Eureka:

Rauch & Company.

This company is composed of Thos. Kennedy, W. McKinney and T. A. Staffer, all of Galena, Kansas, with Mr. Staffer as manager. They are operating three lots on the Eureka and one on the Ihlsing lease at a royalty of twenty per cent on zinc ore while the lead is mined on the \$28 basis. There are four shafts sunk to an average depth of 135 feet in ground a part of which requires timbering for the support of the drifts. The company employes seventeen men and make an average production of about forty tons of zinc ore per week. They are operating two of the four shafts and are cutting on faces of ore from fifteen to forty feet high. They have recently erected a complete concentrating mill, supplied with one eighty horse power boiler, a fifty horse power engine, a fourteen-inch crusher, three sets of rolls, two twenty-four-inch and one eighteen-inch, steam jigs with a five cell

rougher and a seven cell cleaner, three elevators, one revolving screen and two steam hoisters. This plant was erected at a cost of about \$8,500.

Sunny Slope Mining Company.

The Sunny Slope is composed of H. Corning, J. W. Wampler & Son, H. Krumpacker and C. T. Vannes, with Mr. Vannes as superintendent. They control five lots of the Eureka lease and have two shafts down, one to 115 and the other to 138 feet with fair faces of both lead and zinc ore developed in hard ground. The mine is new, but makes a very good showing of mineral. The improvements consist of a forty horse power boiler, a ten-inch lift pump, two hand jigs. The company is putting in steam drills with which to break the ground.

THE BUNCO MINING COMPANY.

The members of this company are W. E. Brinkerhoff, Thos. Heran, Byron Ash, R. S. Stickney, Jas. Luke, Hall & Hill, of Carthage, Mo., and S. J. O'Neill, of Galena, Kansas. The company controls a lease on twenty-seven acres situated at Cave Springs and pay a royalty of ten per cent on all minerals mined. There are seven shafts operated on the lease ranging in depth from fifty to 125 feet. The ore deposits in these mines show up exceedingly well. The company does only a sub-leasing business. They operate two eight-inch lift pumps and have an office and scales. The property is under the management of S. J. O'Neill. We mention some of the operators below:

Hardwick & Sumner.

Hardwick & Sumner, of Galena, Kansas, control six lots of the Bunco lease and operate two shafts at the depth of 120 feet. They have good faces of ore and are expecting to make large productions. They have just completed a large and complete concentrating mill erected at a cost of \$7,500, equipped with two boilers, fifty and seventy horse power, two crushers, twelve and sixteen-inch, three sets of twenty-four-inch rolls and one set of chat rolls, steam jigs with a five cell rougher and a six cell cleaner, three elevators, one revolving screen, one steam hoister, one two-inch Snow steam pump. They pay a royalty of twenty per cent and employ from fifteen to twenty men. The works are under the management of J. W. Hardwick.

Baby Elephant.

The "Baby Elephant" is owned by R. Fincke, of Carthage, Mo., and is located on the Bunco lease. He operates one lot and is mining

at the 125 foot level in open ground which requires timbers for the support of the drifts. This property has been a large producer in former days, but had to almost close down on account of poor drainage. His improvements consist of a boiler and engine, a two-inch discharge Snow steam pump, steam hoister and two hand jigs. The property is managed by Ed. Bailey, of Joplin, Mo.

C. W. Farrington & Company.

This company controls four lots of the Bunco lease and have two shafts down, one sixty and the other seventy-five feet on fair ore, but expect to go deeper. They operate with one steam and one horse hoister and clean the ore on four hand jigs. Their production is fair. C. W. Farrington is manager.

The Junior Mining Company.

The "Junior" was formerly known as the Young America and is owned by Henry R. Kasson, F. C. Peck, W. D. Ford and W. G. Stevens. They control six lots of the Bunco lease and have two shafts sunk to a depth of seventy feet, both of which are in fair ore. This property has also been a good producer in former days, but the company is now sinking deeper in hopes of striking the deeper mineral. The property is under the management of W. G. Stevens.

The Big Hickory.

The "Big Hickory" is the property of E. M. Peebles, T. W. Whitfield, L. S. Durram and R. B. Peebles, of Carthage, Mo., and W. J. Brockman, of Galena, Kansas. Their lease comprises six lots of the Bunco lease on which there are two shafts sunk, one to sixty and the other to the depth of eighty feet with fair face of ore in each of them. The mine is new and is just being opened up. The lease is subject to a royalty of twenty per cent on zinc ore while the lead is mined on the \$28 basis. They have in operation a Snow steam pump and steam hoister.

The Hill Top.

This company is composed of Wm. McMillan and J. E. McWilliams, of Carthage, Mo., who control six lots located on the Wilipus Walipus lease near Cave Springs. They have one shaft sunk to the depth of 134 feet and have developed a twenty foot face of high grade mineral at the ninety-eight foot level on which they pay a royalty of twenty per cent. The developments are sufficient to warrant the erection of a concentrating plant which will be done in the near future.

KANSAS CITY MINING AND MILLING COMPANY.

This company is composed of E. D. Nix, of Joplin, Mo., and Mr. Wiles, of Kansas City, Mo., who have a lease on forty-five acres of the John Jackson estate situated about five miles southwest of Joplin. The company pays a royalty of ten per cent on all minerals mined. There are six shafts sunk, but only one shaft producing ore and it is being operated by this company at a depth of ninety-five feet. The drifts are cut about twenty-five feet wide, some of which are in hard ground and others in open ground which require timbers for their support. The company employs eighteen men and produces about twenty tons of zinc ore per week. The improvements consist of a complete concentrating mill, supplied with a forty and a sixty horse power boiler, two engines, twenty and seventy horse power, a fourteen-inch crusher, three sets of rolls, twenty-four, twenty-two and twelve-inch, steam jigs with a six cell rougher and two cleaners of five cells each, one revolving screen, elevators, one steam hoister, one eight-inch lift pump and one centrifugal pump. The mines are under the management of J. A. Brookshire, of Blendville, Mo.

COLUMBUS MINING COMPANY.

The above company is composed of Isaac Wright, of Columbus, Kansas, and C. F. Spencer, of Joplin, Mo., with Mr. Spencer as manager. They control a first lease on ten acres of mineral land belonging to the John Jackson estate and pay a royalty on all minerals mined of ten per cent and charge operators twenty per cent. They have six shafts sunk to an average depth of sixty-five feet. The ore occurs in hard ground which does not require the use of timbers when properly mined. Their drifts are cut about twenty feet wide on dirt which shows about eight per cent mineral. In addition to operating a plant, the company sub-leases lots to operators. The improvements consist of a concentrating plant erected at a cost of \$4,000, equipped with one seventy horse power boiler, a fifty horse power engine, a double twelve-inch crusher, three sets of rolls, twenty-four, nineteen and fourteen-inch, a revolving screen, three elevators, steam jigs with a five cell rougher and a six cell cleaner, steam hoister, two steam pumps and one centrifugal pump, office and scales. In addition to above, this company in connection with the Jackson Hollow Mining Company, have a pumping station erected on Shoal Creek with 4,200 feet of

four-inch pipe laid, through which water is forced for general milling purposes. We mention below some of the operators on the Columbus.

Three Kings Mining Company.

The "Three Kings" is composed of Riley Robinson and R. J. Bland, of Galena, Kansas, and Jos. Tall, of Kahoka, Mo. They control two lots of the Columbus lease and pay a royalty of twenty per cent. Their shaft is down to the depth of sixty feet from which a fifteen-foot face of zinc ore is being mined which will run about seven per cent zinc. A horse hoister and two hand jigs are being used and a production of about three tons is being made per week. This company is contemplating the erection of a concentrating plant soon.

Spencer & King.

J. W. Spencer and W. S. King, of Columbus, Kansas, operate five lots of the Columbus lease and have three shafts sunk. One of them shows a good face of ore at fifty-six feet, and the second at eighty-five below the surface. The dirt shows about nine per cent zinc, which is considered a good average. A steam and a horse hoister are used for hoisting the dirt. The company is developing the ground preparatory to the erection of a concentrating plant.

Ihlseng & Norton.

This company is composed of Fred B. Norton and A. O. Ihlseng, of Carthage, Mo., who operate five lots of the Ihlseng lease situated at Cave Springs, about six miles west of Joplin. The land embraced in the lease owned by this company carries both lead and zinc ore in large quantities, but zinc is the principle ore mined. They have two shafts sunk, 113 and 115 feet respectively, with a twenty-foot face of ore developed in each shaft in hard ground which requires no timbering for the support of the drifts when properly cut. The company pays a royalty of twenty-five per cent to the lessor and has the advantage of the Kansas City, Ft. Scott & Memphis railway for transportation of the ore. There are fourteen men given employment and from ten to twenty-five tons of ore produced per week. There is a complete concentrating plant in operation, equipped with two sixty horse power boiler, a twenty-five and a forty horse power engine, one sixteen-inch crusher, two sets of twenty-four-inch rolls, steam jigs with a four cell rougher and a five cell cleaner, elevators, revolving screen, two steam hoisters and one eight-inch lift pump. The mines are under the management of Carl Rankin, of Cave Springs, Mo.

Jackson Hollow Zinc Company.

This company is incorporated under the laws of Iowa and capitalized for \$50,000, with H. Hepburn, of Deavenport, president and J. B. Carmichael, of Omaha, Neb., vice-president, and E. L. Hayward, of Joplin, Mo., secretary and manager. Their lease contains forty acres of the John Jackson estate at a royalty of ten per cent, and is situated about five miles southwest of Joplin. There are two shafts sunk with a twenty-foot face of good zinc ore developed in one at the depth of sixty feet. The company also sub-lets lots to operators and charges a royalty of twenty per cent. In addition to the above lease, this company operates four lots of the Columbus Mining Company's lease, which adjoins on the east, at a royalty of twenty per cent and has six shafts down, ranging in depth from fifty to eighty-two feet with ore developed in all of them. The principal working level is at the depth of seventy-two feet, at which level a face of ore thirty-five feet high has been developed in medium ground which is easily broken. There are about eighteen men employed to each shaft and a weekly production of about forty-five tons of high grade zinc ore is made. The company has erected and in operation a complete concentrating plant equipped with three seventy horse power boilers, one 110 horse power engine, a fourteen-inch crusher, three sets of rolls, elevators, screen, steam jigs with a five cell rougher and a six cell cleaner, one steam hoister, one four-inch discharge Worthington pump and a Stillwell heater. The dirt is carried from the shaft to the mill in dump cars holding a ton of dirt by means of gravity, thus doing away with the tub rustler. In addition to the above improvements, this company, in connection with the Columbus Mining Company, have erected and put in operation a pumping plant stationed on Shoal Creek, with a four-inch pipe laid 4,200 feet to the mill, through which water is forced for general milling purposes.

Hawkeye Mining Company.

The Hawkeye Mining Company has a lease of forty acres of the O'Keefe & Carter land. It is a partnership company, of which Hugh McIndoe, of Joplin, is manager and J. R. Morin, of Galena, is superintendent. The company does no mining nor draining.

The Pilgrim Mining Company has a sub-lease of eight mining lots on the Hawkeye lease and has three shafts at an average depth of fifty-five feet. Two shafts are connected by drift carrying a twenty-foot face of ore, from which an average of fifteen tons of ore is cleaned weekly.

Thirty men are given employment in the mine and about the mill. The ground is hard enough to hold safely without timbering. From May 1st to September 1st, this year, the mine produced over 300 tons of high grade zinc ore. The company operates a first-class mill. Hugh McIndoe is manager and J. R. Morin superintendent of the Pilgrim as well as the Hawkeye.

BOSTON-SPRINGFIELD MINING COMPANY.

This company recently purchased 320 acres of land from the Roaring Springs Land and Mining Company for a cash consideration of \$93,500, through J. W. Ground, of Carthage, who holds an interest in the property and is manager. It is a stock company, the majority of the stock being held in Rhode Island and Massachusetts, Mr. Sprague, of Providence, and Mr. Miller, of Springfield, representing the investors from those two states. The company does no mining nor drainage, sub-letting the land in mining lots to operators.

The Scotch Mining Company is organized under the Missouri state laws with a capital stock of of \$50,000, with E. K. Corle, of Kansas City, president, and John Malang, of Joplin, manager. The company has eleven mining lots and four mines producing ore from seventy to eighty-five feet, carrying a face of dirt from twelve to twenty feet high and twelve to 100 feet wide in ground that requires timbering. The ore is disseminated in chert, or flint, and is milled on a modern 100-ton concentrating mill.

The Amy H. mine is owned by Col. H. H. Gregg, of Joplin, who has a lease on four lots and is operating on the seventy-foot level. This mine has produced over \$6,000 worth of ore from two drifts and cleaned on hand jigs. The ore is freely disseminated.

The Keystone mine is owned by McCracken, Barnett & Co., who are operating on the seventy-foot level, using a steam hoist and hand jigs. They have four lots.

McDougall & Peters have two lots and are producing ore from the seventy-five-foot level with a steam hoist and cleaning on hand jigs. The ore is in hard disseminated ground.

Hickok, Sumner & Stout have five lots and have produced \$10,000 worth of ore on hand jigs from one mine. A mill is being built. Carl Stout, of Joplin, is superintendent.

The Monitor Mining Company, of Philadelphia, is superintended by Mr. Beidleman, of Joplin. The company has six lots and is operat-

ing two shafts on the ninety-foot level, having a fifteen-foot face of ore. A modern mill is being built.

A. B. Wilgus, of Joplin, is superintending a property owned by Boston investors, having a lease of four lots, and are producing ore from two shafts on the ninety-five-foot level. This is an old property and has been a rich producer with hand jigs. A new mill is being built.

Cowan & Webb, of Galena, Kan., have five lots and two shafts producing ore from the eighty-five-foot level. They have a thirty horse power boiler, steam hoist and hand jigs.

BELLVILLE DISTRICT.

THE McCLELLAND.

The McClelland embraces a tract of mineral land situated about five miles northwest of Joplin in the Bellville district, containing ninety-three acres which is owned in fee simple by T. A. McClelland, of Kansas City, Mo., and J. R. McClelland, of Joplin, Mo. The entire tract is covered by lease to the East Hollow Mining Company at a royalty of ten per cent and has about eight years of time yet to run. The land carries both lead and zinc ore which is known to exist at different levels from eight to 125 feet. It is a very promising tract of mineral land and will doubtless prove an excellent producer of both minerals. Following are some of the operators.

East Hollow Mining Co.

This company owns a lease of ninety-five acres of land in East Hollow of the Stevens diggings, five miles northwest of Joplin. It is an incorporated company of which J. P. Harris, of Joplin, is superintendent. The company operates a custom concentrating mill, but does no drainage or mining. The property has produced ore intermittently for twenty-five years or more, having the reputation of being mined for lead prior to the civil war. The early workings were very shallow, lead having been found very near the surface. It is now being operated from ninety to 130 feet. Under this company there is an effort to revive the property, but as yet the production has not reached a point to place it in the list of regular producers. A number of sub-lease companies are developing some very favorable ore deposits in new ground and some others are meeting with encouragement in old shafts. There are on the ground six companies, as follows: Bradley & Co., three lots and a horse hoist; Radley & Co., four

lots and a horse hoist; Adam Scott, ten lots, a forty horse power boiler, steam hoist, steam pump, and two hand jigs; Zincite Company, steam hoist, steam pump and hand jigs; Calhoun & Harrison, eight lots, thirty horse power boiler, steam pump, steam hoist and two hand jigs; Foster & Co., sixty horse power boiler, steam hoist, beam pump and hand jigs.

Hagadorn & Rose.

Messrs. R. Hagadorn, of Zincite, and W. N. Rose, of Galena, Kan., have a lease of thirty acres of the Brooks estate in West Hollow of the Stevens diggings. It is operated by sub-lessees and the total sales from May 1st to October 1st aggregated 550,000 pounds of zinc ore. Like East Hollow, this has been a producer for many years, the earlier production being lead taken out at shallow depths. It is now being worked for zinc ore at depths ranging from seventy to 108 feet. Very little lead is found on these levels. The firm operates no mines and does no drainage. There are three mills on the ground, a custom mill owned by Mr. Hagadorn who also mills his own product. It has a capacity of forty tons and the power is supplied by a thirty-five horse power boiler and thirty-five horse power engine.

The Ethel A. is rebuilding a fifty ton mill recently destroyed by fire. It has a sixty horse power boiler, a thirty-five horse power engine, an eight-inch beam lift pump and operates two lots, working at 100 feet in timbering ground. It is owned by Thos. Adams and W. C. Freeman, of Providence, R. I., John and P. R. Newlin, of Joplin, and Richard Russell, of Zincite, Green Sansom, of Joplin, is superintendent. The Ethel A. has produced 374,430 pounds of high grade zinc ore.

The Clover Leaf Company has a forty ton mill and is operating on four lots at 100 feet in timbering ground on a sixteen-foot face of ore. A thirty-five horse power boiler and twenty-five horse power engine furnishes power for the mill and a steam pump and steam hoist. The owners are C. C. Chadwick, Thos. Goodwin and Wm. McIntosh, of Zincite, the former being superintendent. It has produced 95,000 pounds of zinc ore.

The Ground Hog Company has one lot and is taking out zinc ore at 108 feet which is cleaned on a custom mill. It is owned by Fred Myers and H. Meeker, of Joplin, George W. Reid and Frahn and Gene Bennett, of Carthage. The mine has produced 15,000 pounds of zinc

The Sea Gull Company is composed of Charles Earl, Albert and Joseph Camp, of Joplin. They have three lots and are producing ore from the seventy-foot level in hard ground, carrying a twelve-foot face of ore. They use a horse hoist and clean on a custom mill. It has produced 20,000 pounds of zinc ore.

There are five other mines on this lease about ready to begin the production of zinc ore.

R. HAGADORN.

Mr. Hagadorn individually owns a lease on the Lewellyn land, adjoining the above lease on the north, which is developing several good mines on the 100-foot level.

The Rose Lease.

W. N. Rose owns a seven-eighths and A. M. Blunk a one-eighth interest in a lease of forty acres of the Lewellyn land and twenty acres of the Brooks estate in the lower end of West Hollow. Both gentlemen living in Galena, Kansas, the former being superintendent. The firm has drained the ground and now operates two steam pumps. The power station comprises an eighty horse power boiler and a thirty-five horse power engine. With a steam hoister they are operating at ninety-five feet, carrying a twelve-foot face of ore in timbering ground. The ore is cleaned on hand jigs. There are a dozen prospect shafts just in ore, the water having only recently been lowered.

SPRINGER MINING CO.

Warren Springer, of Chicago, and W. F. Page, of Joplin, own a lease on eighty acres of land owned by P. Murphy, of Joplin. The land is an old producer, and is just being reopened. D. E. Harris, of Joplin, is superintendent. The company does no drainage and operates no mines as a partnership, though each have prospects being developed on the ground. Only three mines are producing yet and they are not fully opened up. Operations are from forty to 125 feet deep. The improvements on the lease are all by sub-lessees. Mr. Springer operates a custom mill for those not provided with wash places. There are ten prospect shafts in ore. Pearson & Co. have two lots, work at 110 feet in timbering ground, have a twenty horse power boiler, steam pump and horse hoist. Jones & McDaniels have four lots, work two shafts, one at eighty-five feet and one at 112 feet. They have a twelve horse power boiler, a steam pump, horse hoist and hand jigs. The Olympia has five lots and five shafts with ore devel-

oped in each. A mill is being erected. This property is owned by Chicago parties and Franklin Landis, of Joplin, is superintendent. Harris & Korhammer have two lots, a twelve horse power boiler, steam pump and steam hoist. Harney & Springer have eight lots, a twenty horse power boiler, a beam lift pump, a steam hoist. Epperson & Co. have four lots, twenty horse power boiler, a steam pump and steam hoist. Walker Bros. have two lots, a horse hoist and hand jigs. Page & Hornback have seven lots, a forty horse power boiler, a steam pump and a steam hoist. Myers & Co. have four lots, a fifteen horse power boiler, a steam pump and horse hoist. Rice & Brown have three lots and a horse hoist.

The Kathleen Lease.

J. E. House, of Omaha, Nebraska, owns a lease of twenty acres of the Bruce estate in the south part of Belleville. The workings are in old mines, first developed years ago. They are very shallow, the deepest being forty feet, and the operations are rather meagre, being confined to horse hoist and custom mill work, still the land has produced in the past few months, since April, over 100 tons of zinc ore. Mr. House owns a custom mill of sixty tons capacity, the power for which is supplied by a sixty horse power boiler and thirty horse power engine, and he operates two steam pumps for drainage. Thirteen acres of the tract is sub-let to Campbell & Co., who have a twenty horse power boiler and are running an eight-inch beam pump, and are opening up a number of old shafts.

ARKANSAS MINING COMPANY.

This property is owned individually by R. S. Morris, of Siloam Springs, Ark. C. W. Newlin, of Zincite, is superintendent. It is a lease of forty acres of land owned by W. A. Campbell, of Joplin, and W. C. Freeman, of Providence, R. I. The company has a reserve of six lots on which is a 100 ton mill, one seventy-five and one forty horse power boiler, fifty horse power engine, six-inch steam pump, two steam hoists, operates two shafts in which the drifts are cut together, carrying a face of forty feet of ore on the 165-foot level, cutting with a steam drill. The company produces an average of twenty-five tons of zinc ore weekly. Four other shafts are in ore on the same level.

The Eagle Mining Company, a private company, owned by W. C. Freeman, of Providence, R. I., John and H. D. Newlin, of Joplin. Green Sansom, of Joplin, is superintendent. The company has three

lots, a 100 ton mill, sixty-five horse power boiler, thirty-five horse power engine, eight-inch beam lift pump, steam hoist, and operates one shaft on the 165-foot level, carrying a forty-foot face of ore and produces thirty tons of exceptionally high grade ore, being considered of the highest standard by ore buyers. The average assay runs above sixty per cent and as high as sixty-four per cent, which is almost pure blende.

The North Star mine is owned by a company of St. Joseph, Mo., people, with Mr. Henshaw, of Zincite, superintendent. There is a sixty-ton mill, one sixty and one forty horse power boiler, thirty horse power engine, ten-inch steam end lift pump, four lots, steam hoist, and operated on the 135-foot level, carrying a twenty-foot face of zinc ore, producing fifteen tons of ore weekly.

The Owl mine is owned by a private company of which Charles Earl, of Joplin, is superintendent. There are two lots, a ten horse power boiler and engine, steam hoist and hand jigs, eight-inch beam lift pump. The mine has produced some ore, and is now sinking with a fifteen-foot face of ore on the 145-foot level. There is one other shaft on the property 196 feet deep.

MALLETT, FREEMAN & CUNNINGHAM.

Ed. Mallett, of Zincite, W. C. Freeman, of Providence, R. I., and G. S. Cunningham, of Oklahoma, have a lease on forty acres of land owned by Messrs. Mallett & Freeman. The firm does no mining and no drainage, sub-letting the land in lots of the usual dimensions to operators. There are six producing mines on the tract, most of which have been just opened or are ready to begin the output of ore.

W. B. Mesplay, Dr. Dumbauld, of Carterville, and George Morris, of Zincite, have six lots and three shafts in ore at the 110-foot level. They control the Four Corners, the Daisy and Horse Shoe mines, all big producers of former years. They have a new forty-ton mill, eighty horse power boiler, fifty horse power engine, two beam lift and one steam pump, two steam hoists. George Morris is superintendent.

W. H. Johnson, of Joplin, is superintendent of the Frisco Mining Company, having a lease of six lots, have a thirty horse power boiler and steam hoist, operating one shaft at 110 feet, clean the ore on hand jigs.

C. B. Gammon & Co., of Carthage, own the Red Line mine, have six lots, one shaft 100 feet deep, thirty horse power boiler, twenty horse power engine, eight-inch beam lift pump, hand jigs.

Freeman, Ellis & Schoopman have three lots and are mining at eighty-five feet, using a horse hoist and hand jigs. Wm. Schoopman, of Zincite, is superintendent.

Munson & Grieb, of Carthage, own the Cannon Ball, comprising three lots, have a fifty-ton mill, forty horse power boiler, twenty-five horse power engine, three-inch steam pump, steam hoist, and are producing ore on the ninety-foot level.

LEAD HILL LEASE.

The Lead Hill Mining Company is a private company, composed of Capt. E. O. Bartlett, W. R. and W. A. Hacker, Dr. Z. L. Kay and Ben McCrum, of Joplin, having a lease of RP acres of land owned by Dan Collins, for a period of ten years, three and one-half of which have expired, at ten per cent royalty. This company does no mining and no draining, sub-letting the land in mining lots to operators. There are two large, modern mills on this lease.

The Blossom mine is owned by H. B. Ellis, of Providence, R. I., and Green Sansom, of Joplin, is superintendent. Mr. Ellis has six lots, a 100-ton mill, eighty horse power boiler, thirty horse power engine, three-inch steam pump, and steam hoist. He is operating one shaft at 160-foot level, carrying a forty-foot face of zinc ore. He produces a car load of zinc ore weekly.

The Eureka mine is owned by the Colonial Lead and Zinc Mining Company, of Joplin, Mo., with a capital stock of \$225,000, full paid and non-assessable, at the par value of \$10 per share. The officers are: James H. Dangerfield, Joplin, president; Colon S. Ober, Auburndale, Mass., vice-president; Frederic J. Hart, Joplin, secretary and treasurer; H. Edward Dangerfield, of Joplin, manager. The company has six lots, 100-ton mill, 100 horse power boiler, sixty-five horse power engine, eight-inch steam end lift pump, a steam hoist and operates on the 145-foot level, carrying a thirty-foot face of ore in hard ground, and produces twenty-five tons of zinc ore weekly.

LAWRENCE COUNTY.

THE AURORA DISTRICT.

Developments at Aurora during the fiscal year have kept pace with the improved conditions elsewhere in the district and there has been an enormous increase in the production as well as improvement

in the methods of mining. A large number of new tracts have been opened up, some of the best developed ground in the district has been sold to parties possessing ample capital to thoroughly prospect it with improved machinery and the tendency here as at every other camp in the district is toward deeper mining. Primitive methods are passing away, new high power, modern mills are springing up on every hand and Aurora now ranks, both in point of production and in the grade of ore produced, as one of the leading camps of the district. Following are some of the principal operators in the camp.

HALL LAND MINING COMPANY.

This tract of mineral land is situated one mile northeast of Aurora and contains forty acres. The land is owned in fee simple by John N. Dalby and R. H. Moses, of Sedalia, Mo. The operations of this company here are confined to leasing lots of the land to operators, some of whom we mention below.

Christian Mining Company.

This company is operating on the Hall land and is composed of D. B. Perkins, H. B. Ellis, of Providence, R. I., and R. A. Ollis. Mr. Ollis is superintendent and resides in Springfield, Mo. They control four lots and have one shaft sunk to the depth of 109 feet. Two drifts are being cut, fifteen by twenty feet, in hard ground which does not require the use of timbers for its support. The company gives employment to twenty-six men and produces about thirty tons of silicate ore per week on which they pay a royalty of fifteen per cent. The improvements consist of one pump, steam hoister and eight hand jigs.

Dog Diggins.

This company is operating on the Hall land and controls four lots with one shaft down to the depth of 100 feet, in which they have opened up a face of silicate ore fifteen by twenty feet in hard ground and produce about thirty tons per week. Their improvements consist of one six-inch lift pump, steam hoister and six hand jigs. Twenty men are employed and the mine is under the management of R. A. Ollis, of Springfield, Mo.

No. 12, Hall Land.

No. 12 Mine is located on the Hall land and contains six lots with two shafts, one 105 feet, the other 126 feet, with good silicate ore in each. The company is composed of Geo. Haynes, H. H. Bloss, Geo. Baker and Riley Logan, the latter residing in Texas, with Mr. Haynes,

of Aurora, as manager. They are cutting on a face of silicate ore twelve by eighteen feet and employ ten men. This company pays a royalty of thirty per cent, this being a sub-lease with machinery furnished, and produces about eighteen tons per week. The improvements consist of one six-inch lift pump, a belt hoister, and four hand jigs.

Pup Mining Co.

This company is operating on the Hall land at a royalty of fifteen per cent, and is composed of R. A. Ollis, Chas. Thomson, Bud Mathews and others. Their shaft is 100 feet deep, but not fairly opened up. They employ eight men and use a steam hoister and three hand jigs.

The Queen City Mining Land Co.

This tract of mineral land is owned by John L. Hall, S. H. Bealer, John Montgomery, John M. Dabby, John Galley and G. J. White, of Sedalia, Mo., and J. J. Frey, of Topeka, Kan., and is situated near the city of Aurora. They have one shaft called the "Rose Bud" down to a depth of 100 feet and are opening up a fine face of zinc ore. Several other shafts are being sunk on the land. The company contemplates erecting a concentrating plant in the near future. The improvements at present consist of two eight-inch lift pumps with which the ground is drained below the 100-foot level, horse hoisters, and four hand jigs. The property is under the management of S. H. Minor, of Aurora, Mo.

BOSTON-AURORA.

This tract of mineral land consists of eighty acres situated one and one-half miles east of Aurora and is owned by a Boston, Mass., syndicate who recently purchased the property of Messrs. S. H. Minor, A. H. Rogers and Judge Leo Rassiner. This tract of land is one of the richest, if not the richest, in mineral of any yet developed in the state. The ore faces are large and extremely rich in zinc ore. A single mill of 100 tons daily capacity has concentrated in six consecutive ten-hour shifts, 153 tons and produced fifty tons in a single shift of ten hours. This is the best record yet made by any mill of similar capacity in the state. The company having purchased the fee, and lease on the other producing mines on the land, is operating them itself. There are three concentrating plants in operation on the land, two of which are supplied each with an eighty-five horse power boiler, a fifty horse power engine, a fourteen-inch crusher, three sets of rolls, two twenty-two-inch and one eighteen-inch, steam jigs with a four cell rougher and a five cell cleaner, screen, elevators and steam hoister.

No. 1 Mill, which was the first erected on the land, is equipped with one eighty horse power engine, a ten-inch crusher, one pair of eighteen-inch rolls, one six plunger jig, screen, elevators and a belt hoister. These three mills have produced as high as 500,000 pounds of zinc ore in a single week. There have been twenty-one shafts sunk on the land, ranging in depth from fifty to 135 feet, and the ore deposits are encountered in fifteen of them. The ore faces range from six to forty feet high, and have been cut to the width of eighty feet. The ground is hard and has principally lime stone rock for a roof. Very little timbering has been necessary for its support. This company gives employment to 100 men.

Geo. W. Moore & Co.

This company has a lease on four lots of the Boston-Aurora and sunk their shaft to a depth of seventy feet, after which it was tested with drill which entered the ore body at the depth of 133 feet and continued in rich zinc ore to 188 feet. This company will evidently have a very profitable mine when developed.

Argyle & Co.

Argyle & Co. are operating on four lots of the Boston-Aurora and have their shaft sunk to a depth of ninety feet. Ore was penetrated at a depth of sixty-five feet below the surface on which they are now working. This company also put down a drill hole and entered the lower run of mineral at the depth of 112 feet and drilled to 194 feet with fair ore. This property is managed by F. W. Hutchison, of Aurora.

Ozark Range Mining Co.

This tract of mineral land contains five and one-half lots and is owned by John A. Williams and P. McGannon, of Aurora, Mo., who mine on the lease system and charge fifteen and twenty per cent royalty. There are ten shafts sunk to a depth of forty feet, in five of which both silicate and zinc ore are developed. The ore faces run from six to twenty feet and appear regular throughout the ground. The property is under the management of John A. Williams.

EWING & CO.

This company is composed of S. C. Ewing, J. B. Ronick and M. T. Crittenden, all of Aurora, Mo., and control a lease on six lots of the Ozark Range Land, a short distance west of Aurora, on which they pay a royalty of fifteen per cent. They have two shafts sunk, one

forty feet and the other 110 feet, in which they have developed zinc ore and give employment to fourteen men. The improvements consist of a new concentrating mill just completed, equipped with a fifty horse power boiler, a thirty horse power engine, a fifteen-inch crusher, two pairs of twenty-four-inch rolls, steam jigs with a four-cell rougher and a six cell cleaner, steam hoister, screen and elevators. These mines are under the management of S. C. Ewing, of Aurora, Mo.

Hay City Mining Company.

This property is located on the Ozark Range Mining Co.'s land and embraces four lots, on which ore has been developed. There are three shafts sunk, ranging in depth from seventy to eighty feet, but the zinc ore is being mined at the sixty-foot level, and twenty men find employment. A concentrating plant has been erected on the lots owned by Mr. A. J. Poyner, of Aurora, Mo., equipped with a sixty horse power boiler, a forty horse power engine, a ten-inch crusher, two sets of rolls, steam jigs with a four cell rougher, and a four cell cleaner, revolving screen, elevators, and steam hoister. The production here has been reaching about one car per week, mostly of chat ore. Ten men are employed at this mine.

Indiana Mine.

The Indiana is owned by L. F. Perdue and is located on the Ozark Range land. He has a lease on two shafts sunk to the depth of eighty feet, but is working on zinc ore at the fifty-foot level and is selling his ore in the rough. This is a new mine and is producing five tons per week with five men employed. A steam hoister is used for hoisting the dirt.

World-Herald.

The World-Herald controls six lots of the Ozark Range Mining Co.'s land and have one shaft down to the depth of seventy-five feet with a good body of ore developed, and are contemplating the erection of a concentrating plant in the near future. At present the ore is sold in the rough. This company is composed of A. E. Bleaksly, Thos. Hammond, and J. O. Sturner, of Omaha, Neb., and A. E. Bleaksly, of Aurora, Mo., who has charge of the property.

Parker & Co.

This company has a sub-lease from Ewing & Co., who operate on the Ozark Range land, and operates one shaft at a depth of 140 feet. They have a fair face of zinc ore and produce about three tons per

week, with five men employed. The ore is sold in the rough and is subject to a royalty of twenty-five per cent.

THE PETER STEWART LAND.

Peter Stewart, of Aurora, Mo., owns in fee quite a large tract of mineral land situated about one mile northeast of Aurora, which is being developed into a good producing property. The following are some of the operators on the Stewart.

Methodist No. 1.

This is the property of F. P. Snell, A. M. Zuber, Dan Nicely, Jack Scott, Bob Towers, and Bud Matthews, all of Aurora, Mo. They are operating five lots of the Stewart land at a royalty of twenty per cent, and have two shafts sunk to the depth of ninety-five and 105 feet, with good silicate ore in each shaft, which is associated with some lead. They have developed a fifteen-foot face of ore in hard ground and produce from thirty-five to forty tons per week. A drift is being cut about thirty feet wide and about thirteen men are employed. The improvements consist of a five-inch lift pump, a belt hoister, and six hand jigs. F. P. Snell, of Aurora, is superintendent.

Methodist No. 2.

The Methodist No. 2 is composed of John W. and Jack Scott, Alex. Sparks and Bud Matthews, and others, who operate three lots of the Stewart land. The mine, like all others on this Stewart land, is new. This shaft is down to a depth of ninety feet with a seven-foot face of silicate ore developed. They employ seven men and produce about ten tons of ore per week. The ground is hard and requires no timbering. The improvements consist of one six-inch lift pump, a belt hoister, and four hand jigs.

Baptist Mining Co.

The Baptist Mining Co. is operating four lots of the Stewart land at a royalty of fifteen per cent and is composed of W. L. Bigelow and A. C. Nichols, of Aurora, Mo. They have a shaft down to a depth of 110 feet with a face of from fifteen to twenty-five feet of silicate ore developed. The ore occurs in hard ground and a production of eighteen tons per week is made with sixteen men employed. Their improvements consist of a steam hoister and five hand jigs.

Gumbo Mining Co.

The Gumbo is located on the Brinkerhoff seven-acre tract, but has been handling dirt from a shaft on the Kentucky land, which

three sets of rolls, steam jigs with a four cell rougher and a six cell cleaner, two revolving screens, four elevators, a Freeman steam hoister. This mill is being erected at a cost of \$6,000, and will be ready for operation in a short time.

Madison Lead & Zinc Mining Co.

This company is composed of A. J. Ohring, M. C. Wultforth, of Chicago, Ill., who control by lease five lots of the New York land and have four shafts sunk to a depth of sixty feet each. There has been completed a new concentrating plant here at a cost of \$6,000, which is equipped with a seventy horse power boiler, a sixty-five horse power engine, a fourteen-inch crusher, three sets of rolls, steam jigs with a five cell rougher and a six cell cleaner, elevators, a revolving screen, two steam hoisters, two lift pumps, one seven and one eight-inch. The production here is reported to reach seventy tons per week, with thirty men to the shift employed. The work is under the management of C. F. Roubinger, of Aurora, Mo.

DECATUR LEAD & ZINC COMPANY.

The Decatur Lead and Zinc Company is incorporated under the laws of Missouri and capitalized at \$100,000, with Albert Barnes, of Decatur, Ill., as secretary and general manager. Their tract of land contains forty acres and is situated about three-quarters of a mile east of Aurora. There are four producing shafts, ranging in depth from seventy-five to 105 feet. The ground carries lead, zinc and silicate ore. The company does no mining, but leases to operators. The ground is generally so hard that timbering is not required. We mention below some of the operators on the Decatur.

Summers & Co.

Summers & Co., who are located at St. Louis, Mo., control six lots of the Decatur land and have one shaft down to the depth of 105 feet, with a twenty-foot face developed. They pay a royalty of fifteen per cent and produce five tons of ore per week, with six men employed. A steam hoister is used for hoisting the dirt, which is hauled to a custom crusher for reduction. This company expect to soon erect a concentrating mill. S. L. Summers, of St. Louis, is manager.

Theilen & Co.

This company is composed of J. Theilin, of Aurora, Mo., and E. S. Towers, of Chicago, Ill., and operates four lots of the Decatur land.

They have three shafts sunk to the depth of seventy feet, all of which entered the ore body. The ground contains lead and silicate and 20,000 pounds of lead and three tons of silicate are produced weekly, with five men employed. A steam hoister is used for hoisting and two hand jigs are used for cleaning the ore.

Griffith & Co.

This company operates one lot of the Decatur land and has two shafts down thirty-five feet, from which they produce 3,000 pounds of lead per week, with four men employed. The dirt is hoisted by means of a windless and cleaned on one hand jig.

KENTUCKY MINING COMPANY.

The Kentucky is incorporated under the laws of Missouri with J. C. Van Riper, of Aurora, Mo., vice-president and general manager. This company owns a tract of mineral land containing twenty acres situated about one mile east of Aurora, and operates on the lease system, the operator being charged twenty per cent royalty. There are ten producing shafts on the land, some of which are operated by the following companies.

Ohio Mining Company.

This company is incorporated under the laws of Ohio with N. G. Neely president, and S. C. Cole secretary, both of St. Manis, Ohio, and is operating on the Kentucky Mining Company's land situated about one mile east of Aurora. There are three shafts sunk to a depth of 100 feet with good zinc ore developed in each. A new and complete concentrating plant costing \$8,000 is about completed for the reduction of ore, equipped with two boilers, one 100 and one twenty horse power, four engines, one forty and three fifteen horse power, a fifteen-inch crusher, three sets of twenty-four-inch rolls, four elevators, screens, steam jigs, with five cell rougher and a seven cell cleaner, three steam hoisters, one sludge table, two pumps, one six and one eight-inch, and a two drill air compressor. This company will employ fifty men to the shift, while the work will be in charge of John W. Horn, of Aurora.

Chas. L. Boyd.

Chas. L. Boyd, of Chicago, Ill., operates four lots of the Kentucky land and pays to the land owners a royalty of twenty per cent. He has one shaft down to the depth of 130 feet and has developed a thirty-foot face of zinc ore in ground which does not require timbers for its

support. The production reaches from eighteen to twenty-five tons per week, with twenty men employed to the shift. Mr. Boyd has erected a complete concentrating plant, costing \$6,000, supplied with five boilers, two engines, one crusher, two sets of rolls, steam jig, with a six cell rougher and a six cell cleaner, revolving screen, elevators, steam hoister, one six-inch lift pump with which the ground is drained and one large air compressor which furnishes power for breaking the ground.

St. Louis-Aurora Mining Company.

The St. Louis-Aurora company owns ninety acres of mineral land in fee simple, which is situated about one mile east of Aurora. This land has not been mined extensively since the company's plant burned down some years ago. The land is said to be rich in ore, but it is slow of development. Where mining is carried on now, the dirt is hoisted by horse power and cleaned on hand jigs. The property is under the management of Mr. S. H. Minor, of Aurora, Mo.

REYNOLDS, SCOTT BROS. & CO.

This company is composed of J. N. Reynolds, J. R. Scott, Henry Scott, of Aurora, Mo., S. M. Clarke, S. H. Carey and Jim Murphy, of Pierce City, Mo. They have four lots of the Baldwin land and mill thereon, leased at a royalty of twenty-five per cent. There are two shafts sunk to a depth of 135 feet, at which level a 300-foot face of ore has been developed in each, and from which forty tons of zinc ore per week are produced, with thirty-five men employed. The ground is hard, which enables drifts to be cut thirty-five feet wide without the support of timbers in apparent safety to the miner. We find here the most extensive concentrating plant in the Aurora district, it being double throughout, and erected at a cost of \$13,000 and is equipped with three sixty horse power boilers, two forty horse power engines, two fifteen-inch crushers, four pairs of rolls, two twenty-four-inch and two eighteen-inch, two pair steam jigs with ten plungers to a side, two revolving screens, seven elevators, two steam hoisters and one six-inch lift pump, which drains the ground to the working level. This mine is under the management of S. M. Clarke, of Aurora, Mo.

I. X. L. Mining Company.

The I. X. L. is composed of Mr. Smith, H. M. Zunker, Dr. Richardson and others. They have a lease on four lots of the Baldwin land situated about one and one-half miles northeast of Aurora. The company

has four shafts down to a depth of from ninety to 110 feet with a twenty-eight foot face of silicate ore opened up in ground sufficiently hard that timbers are unnecessary for the support of the drifts. There are twelve men employed, and a royalty of twenty-five per cent is paid. A steam hoister and five hand jigs are used and from twenty to sixty-four tons of silicate ore produced per week. This property is managed by Bud Mitchell, of Aurora, Mo.

May-Flower Mining Company.

This lease contains four lots on the Baldwin land and is owned by H. M. Zuber and Chas. Stanford, of Aurora, Mo. They have one shaft down to a depth of ninety-six feet and have developed a fifteen by thirty-foot face of silicate and lead ore in hard ground and employ eleven men. They pay a royalty of twenty per cent and produce 10,000 pounds of lead and from four to five tons of silicate ore per week. A steam hoister and four hand jigs are used.

White Horse Mining Company.

The White Horse is the property of Geo. Stanford and H. M. Zuber, of Aurora, Mo., and covers three and one-third lots of the Baldwin land at a royalty of twelve per cent. They have one shaft sunk to the depth of eighty-five feet with from six to eight feet of silicate and lead ore developed in hard ground and produce with eight men employed 8,000 pounds of lead and four tons of silicate per week. The improvements here consist of a steam hoister and four hand jigs. Mr. Stauffer, of Aurora, is superintendent.

SNEAVELY & COMPANY.

This company is composed of Ranson and Albert Ashens and John Jackson, who operate two lots of the John Schmook land at a royalty of twenty-five per cent. The property is situated about one and one-half miles northeast of Aurora and has one shaft sunk to the depth of 125 feet, in which a thirty-foot face of silicate, zinc and lead ore has been developed. A horse hoister and two hand jigs are in use and a production of about fifteen tons of silicate is the weekly output.

CAMPBELL & CO.

This company owns in fee about forty acres of mineral land about one and one-half miles northeast of Aurora which is managed by F. W. Hutchison, of Aurora, Mo., who charges operators fifteen and twenty per cent royalty.

Wheat & Loy.

This company is composed of N. Wheat and B. B. Loy, of Aurora, who have a lease on fifteen lots of the Campbell & Co.'s land with two shafts down to fifty-two feet and sixty-five feet. The drill entered the lower ore run at ninety-three feet and continued in ore for a depth of thirty-three feet. This ground was worked at a shallow depth years ago with fair results. The production now reaches three tons of zinc, three tons of silicate, and 1,000 pounds of lead ore per week. The ore occurs in hard ground which does not require timbering. The improvements consist of a ten-inch lift pump, belt hoister, and hand jigs.

BERRY LAND.

This tract of land contains nine acres of land adjoining Aurora on the west. The land is worked at a shallow depth and produces both lead and silicate. No deep prospecting has been done, but the land has the appearance of containing deeper mineral. Horse hoisters are used while the rough stuff is crushed on a custom mill and cleaned on hand jigs. A royalty of ten per cent on lead ore is charged. The land is in the hands of Mr. S. H. Minor, of Aurora, Mo., administrator.

BRINKERHOFF ZINC COMPANY.

This company owns in fee simple seven acres of mineral land situated about one mile east of Aurora which is surrounded by good mines. There are eight shafts on the land sunk to the depth of 100 feet and we are informed that most of them contain good zinc ore. The land was recently sold to Judge Leo. Rassiner, of St. Louis. We find the mill here equipped with two boilers, a thirty and a sixty horse power, two seventy horse power engines, a sixteen-inch crusher, two pairs of rolls, eighteen and twenty-inch, screen, elevators, steam hoister, steam jigs with two six cell cleaners. The new management will mine a great deal more extensively than ever before and we may expect a greatly increased production from this land.

RINKER LEAD & ZINC COMPANY.

This company is composed of S. H. Minor, of Aurora, Mo., who owns a lease on eighty-three acres of mineral land adjoining the city of Aurora on the east and who pays a royalty of from ten to twenty per cent. About fifty shafts have been sunk on the land ranging in depth from fifty to 125 feet which encountered the ore body at various depths. This proves that only development work is needed to bring

this land forward as a good producer. There has been no shaft sunk on the land to the depth of fifty feet that failed to show mineral. The ground carries lead, silicate and zinc ore. The company is incorporated under the laws of Missouri for \$60,000 with Geo. W. Rinker, president, and S. H. Minor, vice-president and general manager.

C. C. PLANK & COMPANY.

This company controls a lease on ten acres of the Rinker land situated just west of Aurora, on which they pay a royalty on all minerals taken from the ground. They have one shaft sunk to the depth of 100 feet in which there has been developed a face of rich zinc ore from twenty to thirty feet in reasonably hard ground, from which good productions are had. The company employs about twenty men. They have just completed and put in operation a new and complete concentrating plant equipped with one 100 horse power boiler, three engines of six, twelve and forty-five horse power, a fourteen-inch crusher, three pairs of twenty-eight inch rolls, steam jigs with a four cell rougher and a six cell cleaner, revolving screen, elevators, a steam hoister, one ten-inch Neosho lift pump and one vertical pump. Mr. C. C. Plank, of Aurora, Mo., is superintendent.

STOTTS CITY.

Stotts City is advancing steadily in the development of its mining industry and the indications are that this flourishing camp will in the very near future be one of the most prosperous in the entire district. The ore is of uniformly high grade and there appears to be vast quantities of it judging from the results of drilling and sinking prospect shafts. The lack of railroad facilities has prevented this camp from developing as fast as would naturally be expected in view of its great natural advantages but the indications are now that the camp will be connected with some railroad system in the course of a few months and with the transportation problem solved, its rich mines will at once invite the investment of outside capital. Following are some of the principal operators:

The Spring River Mining Company.

The Spring River Mining Company, situated at Stotts City, is incorporated under the laws of Missouri with a capitalization of \$150,000. Mr. Wm. C. McClure, of Michigan, is the president, while Mr. A. J. Stevens, of Stotts, City, Mo., is treasurer and general manager. This company owns in fee thirty acres where the mill is located

and 117 1-2 acres of mineral land about one-fourth of a mile to the northwest. There are three shafts sunk on the thirty acre tract ranging from 93 to 180 feet with good zinc ore developed in the two deeper at the levels of 155 and 180 below the surface. The company is at present mining at the 180 foot level with a drift cut twenty-four feet wide and from forty to fifty feet high, and about 375 feet long. This ore face is large with good per centage of high grade zinc ore, the ore assaying from sixty to sixty-three per cent metallic zinc. The ground is hard and the roof of the drift is kept well trimmed and arched, making it apparently a perfectly safe mine for the men to work in. The work of sinking is going on in the third shaft which will soon reach the upper ore level. The company employs twenty men to the shift, and when in regular operation will produce about three cars of zinc ore per week. For several months prior to this writing, July 29, the mines were operated but little on account of placing additional and more extensive machinery. The plant is complete now in every particular and good productions are being made. The concentrating plant is equipped with two boilers, eighty and forty horse power, three engines, two ten-inch crushers, three sets of rolls, a four cell rougher and a five cell cleaner, steam jigs, three elevators, one pair of revolving screens, one steam hoister, one eight-inch lift pump and one five drill Fulton air compressor, from which power is furnished for breaking the dirt. This company has also erected a pumping station on the banks of Spring River, two and one-half miles away, and laid a four-inch pipe, through which the water is forced to the plant for milling purposes, and for the use of other operators from whom a water royalty is received. The company has expended about \$60,000 in development work and improvements and has one of the most complete plants in the district.

Southworth Mining Company.

This company is incorporated under the laws of Missouri and capitalized at \$50,000 with E. Southworth, of Litchfield, Ill., as president, and G. L. Walker, of Stotts City, Mo., as general manager. They operate thirteen and one-half acres of land which they have leased of the Mt. Vernon Mining Company, the land being owned in fee simple by the Stotts heirs. The company has two shafts, one sunk to ninety feet and the other to the depth of 180 feet from which a face of high grade zinc ore forty feet wide and fifty-five feet high is being worked. Two drifts have been cut, one 280 feet and the other 470 feet

long. They employ fifteen ground and eleven top men to each shift and produce about fifty tons of ore per week. A royalty is paid from this ground to the Mt. Vernon Company of twenty per cent. The ground is hard and no timbering appears necessary for the support of the drifts. This company has a very complete concentrating plant, supplied with two sixty horse power engines and two 100 horse power boilers, two twelve-inch crushers, two sets of twenty-inch rolls and one sixteen-inch steam jigs, three elevators, one revolving screen, two steam hoisters, one eight-inch lift pump and two centrifugal pumps.

C. C. C. Mining Company.

This property is owned by H. Brumbeck, of Mt. Vernon, Mo., and is situated near Stotts City. He has a lease on fourteen acres which is a part of the Stotts estate and leased of the Mt. Vernon Mining Company, at a royalty of ten per cent. One shaft has been sunk to a depth of 175 feet in which the ore body was penetrated at the 120-foot level. A drift twenty by fifteen feet is being cut on fair dirt and a production of from three to five cars of zinc ore per week is reported. Like the other grounds of Stotts City, this is hard and no timbers are necessary for the support of the drifts. The company employs fifteen ground and ten top men to the shift. A complete concentrating plant is in operation, erected at a cost of \$10,000, equipped with one 100 horse power boiler, one sixty and one fifteen horse power engine, one fourteen-inch Carterville crusher, three sets of rolls, steam jigs with a six cell rougher, and two cleaners of five and six cells, four elevators, one revolving screen, one steam hoister, and one eight-inch lift pump. This mill is in good condition, and the ore cleaned over it assays as high as sixty-five per cent metallic zinc. The property is under the management of Chas. Shoiner, of Stotts City, Mo.

Keystone Mining Company.

The "Keystone" is the property of Geo. W. Waddell and A. J. Webber, of Wilkesburg, Pa., and Mrs. A. Hamer, of Tiff City, Mo. The company is operating a lease containing ten acres of the Stotts' estate which they obtained of the Mt. Vernon Mining Company at a royalty of ten per cent and which has about fifteen years of unexpired time. As in other mines of this camp, the ground is hard and requires no timbering if properly mined. There are sixteen ground men and seven top men employed to each shift and a reported production of about sixty tons of zinc ore per week. Like the other mines of the Stotts City camp, the ore is of a high grade and sells for about the top

price. There is also at this mine, a complete concentrating plant supplied with one eighty horse power boiler, two engines, sixty and forty horse power, one sixteen-inch crusher, three sets of twenty-inch rolls, steam jigs with a five cell rougher and two cleaners of six cells each, one steam hoister, a revolving screen, three elevators and one ten-inch lift pump. The property is under the control of Geo. W. Waddell with headquarters at Stotts City, Mo., and is well drained.

The New Jack Davis.

The owners of this property are J. B. Davis and W. H. Johnson, of Mt. Vernon, Mo., Grant Hart and Joe Weiss, of Stotts City, Mo., and T. A. Miller, of Aurora, Mo. Mr. Hart is superintendent. They have a lease on twenty acres about one-fourth of a mile northwest of Stotts City. They have one shaft down to the depth of 170 feet in which they entered the ore at the 140-foot level. The ore presence was determined in two drill holes before the work of sinking was begun. The company is now erecting a new mill with which to reduce the ore.

Loy Bros.

This company is composed of H. W. Loy, of Stotts City, Mo., and D. B., S. E., F. H. Loy and N. B. Pearman, of Aurora, Mo. They have a lease on one acre of mineral land which is owned in fee simple by the Stotts' heirs, and pay a royalty of twenty per cent. This shaft is down to the depth of 170 feet from which they are cutting a face of rich high grade zinc and lead ore of from twenty-five to thirty feet. This is a new mine developed in hard ground and is very promising. Ten men are used for the ground work and six on top, while their production reaches about sixty tons of zinc and 15,000 pounds of lead ore per week. The extent of the ore on the sides of the drifts has not been reached. A new concentrating mill has been completed at this mine, supplied with one sixty horse power boiler, one twenty-five horse power engine, a fifteen-inch crusher, a twenty-four and eighteen-inch set of rolls, steam jigs with a four cell rougher and a five cell cleaner, three elevators, steam hoister, one revolving screen and one nine-inch lift pump. The property is managed by W. H. Loy.

Illini Mining Company.

The "Illini" is incorporated under the laws of Illinois with E. Southworth, of Litchfield, Ill., president, and G. L. Walker, of Stotts City as superintendent. They have eleven acres leased of the Mt. Vernon Mining Company at a royalty of fifteen per cent, the land being owned by the Stotts' heirs. Their shaft is down to the depth of

173 feet from which level the ore is being mined. Ore continued in the bottom of the shaft when the work of sinking was stopped. A face of fifty-five feet of high grade zinc ore has been developed in hard ground which requires no timbering if properly cut. This company employs twelve men in the ground and ten on top to each shift and produces sixty tons of ore per week. They have a complete concentrating mill in operation, equipped with two eighty horse power boilers, two fifty horse power engines, one fourteen-inch crusher, two twenty and one sixteen-inch set of rolls, steam jigs with eight roughers and ten cleaners, being double, three elevators, one revolving screen, one steam hoister, and one eight-inch lift pump. The ore face here is extensive from which large and profitable productions have been made.

NEWTON COUNTY.

THE GOBBLER MINING COMPANY.

The "Gobbler" mine is operated by H. Cross, trustee, who resides at Wentworth, Mo., and who operates on a 160 acre tract of mineral land situated one-half mile southeast of Wentworth. There are six shafts sunk on the land ranging in depth from seventy to 100 feet, all of which contain ore, but only two are being operated; good faces of zinc ore being reported in each. The drifts are being cut about twenty feet wide and are from ten to fifteen feet high in hard ground which does not require the use of timbers for a drift of this width. They have a lime cap-rock for a roof which makes the ground apparently safe for the miner to work under. There are fifteen ground men and twelve top men employed to each shift and no accidents have ever occurred of any consequence. The production is fair and very extensive and substantial improvements have been placed on the ground. The shafts are substantially inclosed and connected with inclosed tramways leading to the plant. The plant is a large and complete one, equipped with two boilers, one sixty and the other twenty horse power, three engines, forty, twenty and ten horse power, one sixteen-inch crusher, three sets of rolls, two twenty-four-inch and one fourteen, steam jigs with eight roughers and ten cleaners, three steam hoisters and the necessary pumping capacity to drain the ground. The works are under the management of J. H. Montgomery, of Wentworth.

THE COSMO MINING COMPANY.

This company is operating on a tract of mineral land situated about one mile east of Wentworth and is composed of Chas. Freeman, of Chicago, and others. There are two shafts sunk to the depth of

100 feet, but are operating from only one. The ore faces are not extensively opened up and only about thirteen tons of zinc ore are being produced per week. The land is reported leased from the Pierce City Mining Company and is under the management of R. C. Young, of Wentworth, Mo. The company has erected a very complete concentrating mill, supplied with one sixty and one eighty horse power boilers, a sixty and a 130 horse power engine, a fifteen-inch crusher, two sets of twenty-four-inch rolls, four elevators, one revolving screen, steam jigs with a four cell rougher and a five cell cleaner, two steam hoisters and one eight-inch lift pump with which the ground is drained.

GRANBY MINING & SMELTING COMPANY.

The Granby Mining & Smelting Company is an incorporated company operating at Granby, Newton county, and controls about 8,000 acres of mineral land, the most of which lies near Granby and is owned in fee simple by the company. Mining was begun here in 1854 by Blow & Kinnett, who continued to operate until their works were burned down during the war. The present company organized and purchased the property then owned by Blow & Kennett, in 1865, and have continued to add new lands until the above amount has been acquired. After this purchase by the Granby Company, they rebuilt the lead smelter and in later years added the reduction works for zinc ore. Their reduction plant is one of the largest and most complete in the state, covering 88x250 feet and is equipped with two large crushers, three sets of rolls, two boilers, 100 and 120 horse power, three elevators, screen, twelve four cell steam jigs, four engines from ten to forty horse power, a Cameron and a derrick lift pump which furnish water for general milling purposes. The smelting department is equipped with five Scotch or blast eyes where the lead is smelted and run into pigs. The smoke from the eyes passes through a brick trail about fifty feet long and into settling house number 1, in which there are three rooms for it to pass through, and from there another trail leads up the hill-side about 300 feet and into settling house number 2, where it is made to pass through three or four rooms and out of this into the trail 300 feet farther up the hill where settling house number 3 is located. There are two rooms in this house and after the smoke and fumes pass through these rooms they are conducted to and out a brick stack fifty-seven feet high. These smoke houses are built of brick and the smoke caught in them and the train contains forty

per cent lead and is taken back and smelted again. The company has also complete machine shops in which are the planer, drill presses, the lathe, belt cutter and steam power saw for sawing the metal, also the blacksmith forge. The pumps, boilers and all repairs for the mines and concentrating plants are made in these shops. The company has also just completed the erection of a new and complete concentrating plant at a cost of \$10,000, located about one-fourth of a mile to the northeast of the smelting works. This plant is of a 100 tons capacity and was built principally for custom work and is equipped with two eighty horse power boilers, and two fifty horse power engines, a fourteen-inch crusher, three sets of rolls, two thirty and one twenty-four-inch, a six cell rougher and two five cell cleaners, steam jigs, two Wilfley tables, elevators and screen. The greater portion of the ore is sold to the Granby Company in the rough or hauled to their plant where it is cleaned ready for the market at a fixed price per ton. Aside from the company's two plants, there is only one steam concentrating plant on the company's lands in operation. The productions are of lead, zinc and silicate ore which is generally found in open ground which at some points requires timbers for the support of the drifts. There are two drills kept running by the Granby Company and on an average of one hole in ten put down the ore is struck; yet out of seven drill holes put down a little to the north of the smelting works, five of them penetrated the ore body at 285 feet and continued in ore to the depth of 305 feet. This demonstrates the fact that rich ore bodies are to be found at great depths at this famous old camp. The Granby Company has nineteen steam hoisters, five horse hoisters and thirty-six of the Granby lift pumps are in operation. Where they lease lots on the royalty system, twenty per cent on all minerals mined is charged. There are 340 men, including miners, washers, mill men and teamsters who receive employment on the company's land. The general management of the Granby mines is in the hands of Mr. John Kingston, of Granby, Mo.

THE MASCOT MINING COMPANY.

The "Mascot" is owned by W. H. Green, John Blunk, R. Kugle, and H. F. Meadows. This is the only company operating a steam concentrating plant on the Granby land which is operated on the royalty system. They control ten acres by lease and pay a royalty of twenty per cent. One shaft has been sunk to the depth of 136 feet, but the ore is being mined at from seventy-five to 100 feet, making a twenty-five-foot face on which they are cutting. The ore occurs in

a twenty-five foot face on which they are cutting. The ore occurs in hard ground which does not require the use of timbers for the support of the drifts when properly cut. The dirt is of good percentage zinc ore, the production reaching about fifty tons per week with thirty-five men employed. The company has a complete concentrating mill in operation, supplied with two forty-five horse power boilers and one forty-five horse power engine, a fourteen-inch crusher, three sets of rolls, steam jigs with a four cell rougher and a five cell cleaner, four elevators, screen, steam hoister and a ten-inch derrick lift pump. The mines are under the management of W. H. Green, of Granby, Mo.

HAMILTON & COMPANY.

The company is composed of W. H. Hamilton, of Clinton, Ind., W. F. Carter, G. C. Haysler and R. H. True, of Clinton, Mo. They have a lease on five lots of land owned in fee simple by J. B. Davis, of Granby, Mo., and have three shafts sunk to the depth of ninety-seven feet with ore developed in each shaft in hard ground. This mine is situated about two miles southwest of Granby and is only a few yards from the line of the Granby Company's lands on which the "Mascot" is located. Very good bodies of zinc ore have been developed at these mines, being sufficient to warrant the erection of a concentrating plant which has just been completed and ready for operation. The plant is equipped with two boilers, seventy and twenty horse power, an eighty horse power engine, one twelve-inch crusher, two eighteen-inch and one twelve-inch set of rolls, a five cell rougher and a six cell cleaner steam jigs, two elevators, screen, steam hoister and one steam pump. This is the only mine opened up near Granby which is not on the Granby Mining & Smelting Company's land.

THE BATTLE-AX MINING COMPANY.

The "Battle Ax" company is composed of S. H. and J. V. Veatch, J. D. Hatton and Lou Roth, all of Webb City, Mo. They control five acres of mineral land leased of Joe Brown at a royalty of twenty per cent and have three shafts sunk, ranging in depth from thirty-five to 112 feet. Shaft number 1 developed a good body of silicate at the depth of thirty-five feet. Shaft number 2 is eighty-eight feet deep and showed very good zinc ore at thirty-five and seventy-five feet. The third shaft is down to depth of 112 feet with a four foot face of rich zinc ore developed at the thirty-five foot level, also a body of zinc ore from sixty-five to seventy-seven feet. The shaft penetrated ore again at the ninety-eight foot level which still continues in bottom of the

shaft. These are new developments and in our opinion will prove profitable to the owners. The land is situated about fifteen miles southeast of Webb City and about seven miles northwest of Granby.

SPRING CITY MINING COMPANY.

The Spring City Mining Company was incorporated in 1892 under the laws of Missouri with a capitalization of \$5,000, and is officered as follows: Ed. Zellken, as president, and J. W. Allen, of Joplin, Mo., as secretary and manager. The lease comprises forty acres of mineral land situated seven miles south of Joplin, at Spring City, Newton county, and is owned in fee simple by J. W. Allen. There are five shafts sunk on the land ranging in depth from 100 to 138 feet, but the principal working levels are from 106 to 135 feet. An ore face fourteen feet high and seventy feet wide has been developed at the 106 foot level which carries both lead and zinc and is producing weekly about 35,000 pounds of lead and about 40,000 pounds of zinc ore. The Spring City Company pays a royalty to Mr. Allen of ten per cent and charges the operators who sub-lease lots a royalty of twenty per cent. Following we mention those who are operating on the Spring City lease.

La Salle Mining Company.

This company is incorporated under the laws of Missouri with a capitalization of \$25,000 and is composed of H. L. Angell, of Chicago, E. S. Tawning, of New York, and J. W. Allen, of Joplin, Mo., who is general manager. Mr. Angell is the secretary and treasurer and J. C. Thornton, of Joplin, Mo., is the superintendent. The company controls eight lots of the Spring City lease and have four shafts sunk ranging in depth from 106 to 125 feet and have developed a face of lead and zinc ore in hard ground fourteen feet high and seventy feet wide. They employ eighteen men and produce about 35,000 pounds of lead and twenty tons of zinc ore per week. Since 1892, the date of the organization of this company, they have mined and sold over \$332,000 worth of mineral and have the distinction of placing in operation the first Snow pump brought to the district. This company erected and put in operation about a year ago one of the most complete and modern concentrating plants in the district, equipped with two boilers, forty and forty-five horse power, an Atlas engine, a fourteen-inch crusher, three sets of rolls, twelve, eighteen and twenty-two-inch, a six foot revolving screen, three elevators, steam jigs with a five cell rougher and a six cell cleaner, two steam hoisters and a 10x7x10 Snow steam pump.

Davidson & Gollott.

Davidson & Gollott operate a tailing mill on the Spring City lease and with five men employed are producing from eight to ten tons of zinc ore per week. Their tailing mill is supplied with a thirty-five horse power boiler and a twenty-five horse power engine, two sets of rolls, screen, large steam jigs with a three cell rougher and a four cell cleaner, elevators and a centrifugal pump.

Jay Bird.

The Jay Bird is the property of E. M. McAdams, F. C. Godding, R. A. Thornton and F. A. Fant, all of Joplin, Mo. They are operating two lots of the Spring City lease at a royalty of twenty per cent and have a ten foot face of rich ore developed at 135 feet below the surface. The ore is of the high grade and brings about the top of the market. The company is just opening up the mine preparatory to the erection of a complete concentrating plant and are only employing about twelve men. The mines are under the management of F. C. Godding.

NEMO MINING COMPANY.

The "Nemo" lease is owned by Geo. C. Meese, T. C. Maloy, Geo. S. Page, and R. B. Cholmondley, all of Joplin, Mo. The lease comprises 120 acres of mineral land owned in fee simple by E. B. Skimmerhorn, of Galena, Kansas, and E. J. Kelly, of Joplin, Mo. The land is situated about five miles south of Joplin and is subject to a royalty of ten per cent, while the operators are charged twenty per cent. There have been twenty-eight shafts sunk, ranging in depth from thirty to 100 feet with ore developed in ten of them, and five of which have been producing ore. The ground is open and requires timbers for the support of the drifts. The principal ore deposits are found at from sixty to 100 feet below the surface. A drill hole put down to a depth of 150 feet, showed a face of rich ore from eighty-four to 117 feet. The ground carries lead, zinc, silicate and carbonate. The carbonate assaying fifty per cent. The water is very weak, as only a six-inch lift pump is used for drainage purposes. The ore is cleaned over hand jigs. As this lease is new and only development work done, only about \$4,000 worth of ore has been turned in since the opening of the lease in January last. The lease is under the management of Geo. C. Meese.

SHOAL CREEK MINING COMPANY.

The Shoal Creek Company is composed of Wm. Brandli, Wm. Phillips, Wm. Dean, Frank Kinford, Pearce and Jas. Clark and John B. Redding, of Joplin, Mo. They have a lease on forty acres of land owned in fee simple by John W. Freeman, Dr. Price and W. C. Howard, of Joplin, Mo., at a royalty of ten per cent. There are twenty shafts sunk on the land, ranging in depth from fifty to 130 feet with ore developed in five of them at from forty to sixty feet. Lead and zinc ore are the minerals produced and exist in open ground which requires timbers for the support of the drifts. The company sub-leases to miners at a royalty of twenty per cent on zinc ore and twenty-five per cent on lead. There are about thirty-five men employed on the lease, ten horse hoisters in use and the production reaches about fifteen tons of zinc ore. These developments are new and among those who have been fortunate in striking rich mineral on the lease is Gen. Jas. S. Coxey, of Ohio. The lease is under the management of John Isaac, of Joplin, Mo.

HENRIETTA MINING COMPANY.

This company is composed of W. H. and O. H. Picher, of Joplin, Mo., J. W. Reinmiller, of Neosho, Mo., and John Reinmiller, of Saginaw, Mo., manager. Their lease covers 180 acres of mineral land situated at Saginaw, about six miles southeast of Joplin, and was obtained for a period of ten years at a royalty of ten per cent. Twelve shafts have been sunk on the lease ranging in depth from thirty to eighty feet with paying mineral developed in seven of them. The company charges operators a royalty of twenty per cent. Following we mention some of the operators:

Wonderful 8.

The Wonderful 8 is owned by John Reinmiller, W. H. Picher, J. W. Reinmiller and R. R. Armer. The company operates four lots of the Henrietta lease at a royalty of twenty per cent. They have one shaft down to a depth of sixty-five feet and are cutting fourteen by sixteen-foot drifts in very rich lead dirt. Ore is to be seen in the sides of the drifts for a distance of eighty feet. This mine has been one of the largest lead producers in the entire district, yielding from 25,000 to 60,000 pounds of the ore per week. There is also a very fair face of zinc ore but only the lead ground is being worked. The im-

provements consist of two small boilers, a steam hoister, two eight-inch lift pumps, one fourteen-inch crusher, four hand jigs, tool house, etc. Operations were begun here in November, 1898, and the first turn-in was made in January, 1899, since which time to September, 20, a dividend of \$10,500 has been declared. The company employees twelve men and its mining operations are under the management of J. W. Reinmiller.

Knowlden & Company.

This company is composed of Perry Knowlden, of Saginaw, Mo., J. W. Thurman, of Kansas City, Mo., and others. They are operating two lots of the Henrietta lease with one shaft to the depth of eighty feet. A thirty foot face of rich silicate ore with some lead and zinc has been developed. This is a new mine, but is sufficiently developed to warrant the placing of machinery with which to handle the ore.

Sweet 16.

The Sweet 16 is owned by I. J. Daniel and Frank Turk, of Saginaw, Mo. They operate one shaft on the Henrietta lease at a depth of eighty feet and produce 4,000 to 10,000 pounds of lead ore per week with six men employed. The ore occurs in open ground which requires timbers for the support of the drifts. A steam hoister is used for hoisting purposes and the ore is cleaned on two hand jigs.

Armor & Johnson.

This company operates on the Henrietta lease and has one shaft down to the depth of 100 feet with a twenty-foot face of silicate, lead and zinc ore developed. This mine is also new and only partly opened up.

Preidy.

Mr. Preidy, of Ohio, controls one lot on the Henrietta lease and has one shaft sunk to the depth of thirty-five feet with a six-foot face of very rich zinc and lead ore developed.

BARRY COUNTY.

MARIOTT & BERRY.

This company is composed of J. G. Mariott, of Purdy, Mo., and Wyley Berry, of Aurora, Mo., who own a lease on the land belonging to John Kelley, of Springfield, Mo., situated three and one-half miles east of Purdy. They pay a royalty of ten per cent and load their ore

for shipment on the Frisco road at Purdy. There are ten shafts on this land, ranging in depth from thirty to eighty feet and ore has been developed in seven out of the ten shafts and five of them are being worked. Two ore levels have been developed, at forty-six and seventy feet, respectively. At the present time the principal production is silicate, but it is very evident that good bodies of zinc ore will be developed at a greater depth. The company is operating the land on the royalty system and is sub-leasing to miners. J. G. Mariott, of Purdy, is the manager of the lease.

Independence No. 4.

The Independence No. 4 is the property of J. W. Mondy and Matthew and Virgil Hadley, of Monett, Mo., who are operating two lots on the Mariott & Berry lease. Their shaft is down to a depth of fifty-six feet, but a face of good silicate, seven by twelve feet is being worked at thirty-five feet from the surface and a production of about ten tons per week is made. Their machinery consists of a horse hoister, crusher and two hand jigs. They pay a royalty of twenty per cent and employ six men.

The Windy Run.

This property is owned by Stephens, Smith & Cullup, of Purdy, Mo., who are operating four lots of the Mariott & Berry lease. Two shafts have been sunk to a depth of fifty-two feet and a four foot face of silicate was penetrated in each from which about ten tons per week is produced.

Gurley & Douglass.

Gurley & Douglass are operating two lots of the Mariott & Berry lease and are drifting on a seven foot face of silicate at twenty-eight feet from the surface. Two men are employed here and they make a fair output and pay a royalty of fifteen per cent on silicate and zinc.

The Big Five.

This property consists of two lots of the Mariott & Berry lease and is worked by W. D. Gurley, J. Y. Drake, Anderson Maddy and G. W. Moore, of Purdy, Mo., the shaft is sunk to a depth of fifty-six feet, but they are drifting at forty-six feet from the surface. They employ three men and pay a royalty of fifteen per cent on zinc and twenty per cent on lead ore.

R. A. 5. Shaft.

This property is owned by James Jack and Edward Smith, of Purdy, Mo., and J. W. Bright and D. L. Buley, of Monett, Mo., who

operate two lots of the Mariott & Berry lease. They have penetrated twelve feet of good zinc and silicate at forty feet and are still sinking in ore. They employ five men and pay a royalty of fifteen per cent on zinc ore, using a horse hoister to raise the ore.

Smith & McGuire.

Smith & McGuire have a seven foot face of good silicate at thirty feet. Their lease covers two lots and they pay a royalty of fifteen per cent on zinc ore.

Wm. Gann.

Wm. Gann, of Purdy, Mo., owns a lease on one acre of the W. Lowery land three and one-half miles east of Purdy from which he is taking silicate. He pays a royalty of ten per cent.

A. J. HENDERSON.

This property contains 469 acres and is owned by A. J. Henderson, of Purdy, Mo. There are two shafts sunk, one to a depth of sixty feet, showing an eight-foot face of jack and silicate and still in ore. On this property a tunnel has been cut in the bluff and from the tunnel and the shaft, thirty-five cars of ore have been mined and shipped. A concentrating plant is in course of erection, supplied with a forty horse power boiler, thirty horse power engine, a fourteen-inch crusher, two sets of rolls, a belt hoister, Snow pump and six hand jigs. Zinc and silicate are found at this mine in good quantities. The property is located four miles east of Purdy.

PIONEER MINING & MILLING COMPANY.

This company is incorporated with a capital of \$200,000. J. P. Richarz, of St. Louis, is president, and J. P. Kennedy, of Pioneer, secretary. The lease covers forty acres about one mile south of Pioneer, and seven miles west of Purdy from which point the ore is shipped via Frisco railway. The land is owned in fee by T. D. Northcutt, of Grangerville, Mo., who gets a royalty from the leasee. The Pioneer Company has sub-leased to Riley Stephens, of Stotts City, Mo., at a royalty of twenty per cent for a term of three years. There are other shafts in operation at a depth of from twenty-five to forty feet producing zinc, lead and silicate. This company gives employment to thirty men and a production is reported of two cars of silicate and zinc and about 10,000 pounds of lead ore per week. The land is platted into mining lots 190 by 200 feet. The improvements consist of a very

complete concentrating plant erected at a cost of \$3,750, equipped with a sixty horse power boiler, forty horse power engine, steam jigs with four cell rougher, and six cell cleaner, two sets of rolls, fourteen and eighteen-inch, respectively, twelve-inch crusher, revolving screens, elevator, steam hoister, office, scales, etc. An ore face of fourteen feet high and fifty feet wide has been developed in soft ground which requires timbering to support the drifts.

W. T. Burton.

W. T. Burton is operating one lot on an acre tract known as the Cloud land one and three-fourths miles south of Pioneer. He pays a royalty of ten per cent and has a seven foot face of silicate and makes a fair output, employing four men.

Neosho Mining Company.

The Neosho Mining Company owns a lease on five acres of the Frank Stewart land situated one and one-half miles south of Pioneer on which one shaft has been sunk to a depth of forty feet. Good zinc ore is being hoisted from this shaft which is being sold to the Pioneer Mining Company in the rough. This company pays a royalty of ten per cent.

PRICKETT, ROBERTS & COMPANY.

This company is composed of L. E. Prickett, Perry Roberts and H. Lakin, of Monett, Mo. They are operating a five acre lease on lands owned by E. A. Buren which is situated at Globe, four miles east of Monett, on which they pay a royalty of eight per cent on all minerals mined for a term of fifteen years. Their shaft is down fifty-eight feet at which level good zinc ore is being developed. This development is in a new locality and being near the city of Monett, the people of that busy city will doubtless soon reap the benefits of a live mining camp of their own as this strike has caused a movement in prospecting unequaled in older camps, and will cause developments of mineral to be made in other localities near.

MORNING STAR.

The Morning Star Mining Company is composed of Nute Hailey, O. H. Thiele and S. A. Newman, all of Cassville, Mo. They control a lease on forty acres of mineral land situated about eight miles east of Cassville at a royalty of eight per cent on all minerals mined for a

term of ten years or until they have exhausted the mineral deposits. This company, instead of sinking shafts, is arranging to tunnel in the side of the mountain and have gone almost a sufficient distance for commencing the tunnel and be sure of safe cap-rock. In blasting this short distance, probably twenty-five feet, they have opened up a four-foot face of zinc ore with some lead about twenty-five feet wide. The ore is of a high grade and the crush stuff piled out will run a good percentage of zinc. In view of the fact that this development is located on the south side of the mountain, and that similar developments are being made on the north and west side of the mountain at about the same level, we are inclined to the belief that extensive bodies of mineral will be opened up when distance in the mountain is gained.

SOUTHEAST MISSOURI.

ST. FRANCOIS COUNTY.

Mining for lead was commenced in this county as far back as 1742; the operations, however, were quite limited and so continued until the close of the civil war. Up to the year 1869, comparatively nothing was known of the immense deposits of rich ore which was hidden under the surface, of what is now recognized as the richest lead producing section in this or any other state. Along about February, 1869, prospecting with the diamond drill was commenced, and the conditions of this section proving most favorable for this kind of prospecting, the wonderful deposits of galena disseminated through the magnesian limestones were disclosed. The drill has ever since been employed, and year after year new and extensive tracts of rich mining ground has been developed. To what extent the vast territory controlled by the four principal mining companies of this county, may be said to carry ore bodies, is not of record outside of the private records kept by the respective companies; enough, however, is known to indicate that there are thousands of acres underlaid with this ore-bearing rock.

The output of lead ore from this county for our fiscal year, ending June 30, 1899, amounted to 98,114,841 pounds or 70 per cent. of the entire lead product of the state, the value of the same being \$2,041,059. This was the product of but the four following named companies: The St. Joseph Lead Company; Doe Run Lead Company; Desloge Consolidated Lead Company and the Central Lead Company.

The question is often asked, why is it that for so long these few companies have carried on such extensive operations and acquired so much rich territory without creating more of a stir than has been witnessed? The reader with the further facts which we will furnish,

may be able to form his own conclusions; we know, however, that these companies have an eye to business, unusually modest in all matters pertaining to the same, comply strictly with the mining laws, furnish satisfactory answers to our requests for amount and value of product, number of men employed, wages paid, afford every facility for an inspection of plant and mines and display a commendable zeal in providing every appliance that tends to greater safety for its employes.

Still another question is as frequently propounded. Why are there so few operators in a section so extensive and abounding in such rich mineral fields? The answer to this is more apparent, for all who are acquainted with the wide difference between the mining operations of the southwest and that of southeast Missouri, readily appreciate the great difference in the cost of reaching the ore. In St. Francois county, in order to reach the disseminated ore, shafts have to be sunk all the way from 300 feet to 450 feet in depth; such shafts must of necessity be very much larger than those in the southwest; the immense amount of water encountered is a most serious and expensive matter to be taken care of not only while sinking, but ever after and sometimes in such increasing volume as to force the abandonment of a shaft and the sinking of another. The machinery necessary to take care of this water, to do the hoisting and run a concentrating plant corresponding with the amount of business that must be done to sustain the cost of operating such plant, adds largely to the cost of equipment. So that, with the great cost of sinking, the very expensive machinery and the great outlay for a concentrating plant and other structures that must measure up to the requirements, sums up into such large proportions that it permits of only the very wealthy to undertake mining in this county. For the above reasons, good and sufficient excuse, we think, is furnished why competition has not been more active in this section.

The attention of capitalists has been drawn to this section within the last year and several new companies are about to commence operations with up-to-date plants. That the current year will add largely to the output of the county, may be expected as the result of these new enterprises. There are still other companies that have been prospecting, that are backed with abundant means, and we understand they are sinking shafts where the tests made have proven satisfactory. The companies operating in St. Francois, for some years past, are as follows:

ST. JOSEPH LEAD CO.

The most extensive plant and the most productive lead mines in the county belong to the St. Joseph Lead Company. This is considered the greatest lead company in the world, and the value of its mineral property, plant, production and railroad, entitles it to that distinction. The company was organized under the laws of the state of New York in 1864, it having acquired originally by purchase the 946 acres of land formerly known as the "La Grave mines," and embraced within its limits what is now, Bonne Terre, a beautiful little city of 5,000 people and possessing many modern improvements.

Mining had been carried on here by its former owners in a desultory way, with no attempt at a systematic method of developing and the new owners for some time followed the primitive methods employed by its predecessors; but this was due largely to the unsettled condition of the community and matters generally growing out of the political uncertainties of the times; many difficulties were encountered, and many obstacles had to be overcome. In the effort to mine after the old way temporarily, it was found that the employes were subject to so much exposure that the output was made dependent upon the weather, for much of the time it was either too hot, too cold or too wet to work. To avoid results so unsatisfactory the old methods were abandoned and the company, in 1869, purchased and put in operation what proved to be the first Diamond Prospecting Drill introduced in the State of Missouri. This enterprise, though at first unsuccessful, did, however, within a few months, develop those enormous deposits of disseminated lead ore, which have ever since that time furnished the extraordinary products of the St. Joseph Lead Company, and from present indications bid fair to prove for many years to come the prime factors in the lead production of southeast Missouri. The ever increasing product from this new discovery has necessitated a constant addition to the concentrating plant, until to-day this admirably designed and constructed plant stands without a rival in any country.

The process for smelting formerly employed, while well adopted for handling a small product, was found unsuited for the economical handling of the increased output of ore, and a radical change in the method of smelting concentrates was decided upon. After experimenting some time, a new process was successfully introduced in 1879. As is commonly the case, one improvement called for another, expan-

sion in one direction necessitated a corresponding expansion in another direction. Transportation facilities to the Iron Mountain Railroad, a distance of 12 miles over an ordinary county road proved altogether inadequate for the enlarged business, so this suggested a railroad. The company thereupon decided upon the construction of a narrow gauge railroad from its works to Summit, a station on the Iron Mountain Railroad. This road was $13\frac{1}{2}$ miles long, and was operated in the spring of 1880. The company having so thoroughly met all the requirements needed for the conduct of its business on a liberal and extensive scale, and yet at the same time exercising all possible economy, very naturally anticipated an extended period of prosperity, and, though every precaution had been taken that prudence would suggest in guarding against accident or loss, yet in spite of all this, one Sunday morning early in the month of February, 1883, the concentrating plant caught fire and was totally destroyed, involving a loss of several hundred thousand dollars to the company. Nothing daunted, however, by this calamity, the company immediately set to work to rebuild its plant, and in four months from the time of the fire, had in perfect running order a concentrating plant combining all the most modern improvements and a capacity of 1,000 tons of rock per day. The new works have been in constant and successful operation ever since, with such changes and improvements made from time to time as would keep the plant fully abreast of modern practice and appliances. The narrow gauge road to Summit Station proving inadequate, a new narrow gauge road to Riverside, a point on the Iron Mountain Railroad 27 miles south of St. Louis, and on the bank of the Mississippi river, was commenced and finished in 1890. In 1893 the railroad was extended in a southerly direction to Doe Run, 16 miles from Bonne Terre, making in all nearly 50 miles of railroad. The extension of this road caused the development of the Flat river mines, where the company had acquired extensive and valuable tracts of land. The narrow gauge necessitating a transfer of all freight to connecting lines, and the business of the company assuming such vast proportions made necessary a change of gauge, and since 1895, the Mississippi river and Bonne Terre Railroad has been operated as a standard gauge road.

In addition to this, 50 miles of standard gauge railroad (said to be the best paying road in the state), and the magnificent plants at Herculaneum, Bonne Terre and Doe Run, this company owns 16,000 acres of land, 7,000 of which it is claimed is good mineral land. From its several shafts, of an average depth of 300 feet, there was produced during our fiscal year 40,049,150 pounds of lead ore, and from its

smelters 34,450,200 pounds of pig lead. The colossal proportions of this enterprise and the wonderful success attained in all of its operations is due largely to Mr. C. B. Parsons, its superintendent, and the able assistance of his assistant, Mr. Gustave Setz.

THE DESLOGE CONSOLIDATED LEAD CO.

The property of this company is located about four miles south of Bonne Terre, and connected with the M. R. & B. T. R. R. by a switch at the town of Desloge. This property was formerly known as "The Mine a Joe or Bogy Mine," on which mining was commenced in 1801, and worked quite extensively after the old methods employed in surface work. The ore was found in openings running east and west for a mile or more, the galena often occurring in pure masses of several hundred pounds weight. The Bogy Lead and Mining Company prospected after this with the diamond drill, but no important results were reached until the present company took charge. The present company is capitalized for \$1,000,000, owns 2,800 acres of land, operates two shafts, 300 and 325 feet respectively, and has an excellent equipment consisting of 9 steam boilers, 5 steam pumps, 2 air compressors, 2 steam hoisters, 3 crushers, 45 steam jigs. The concentrating plant is very complete, labor saving devices have been carried to the point that after ore-bearing rock has been delivered to the surface, the hand of man has been dispensed with in its crushing, washing, cleaning, etc.; the pure ore being delivered in the cars ready for shipment automatically.

The output of this company for the past six fiscal years ending with the 30th day of June of each year, has been as follows:

For the year 1894.....	4,500,000 pounds
For the year 1895.....	8,400,000 pounds
For the year 1896.....	9,300,000 pounds
For the year 1897.....	10,400,000 pounds
For the year 1898.....	18,654,000 pounds
For the year 1899.....	20,088,000 pounds

Total.....	71,342,000 pounds
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This company owns the land on which the town of Desloge is built and will not sell a foot of it for any purpose. All persons who have constructed buildings for business or for homes, have been compelled to simply lease the land upon which the same are located from the company for a term of years. This largely destroys the comfort in feeling that one owns his property; but with this great drawback to improvement, yet the inspector, during his last visit to this place, was

struck with what he saw in the great number of new buildings and those in process of erection; considering the size of the place, it showed more new buildings than he had ever noticed in any mining section of the state. The homes here are not the ordinary miners home so frequently met with in certain sections, but are mostly neat and attractive cottages. With the new shafts being sunk in the vicinity of Desloge and the increasing business of the shafts already at work, this town has good reason to anticipate growth all along the line.

The company experienced but one strike during the year and that was of short duration and easily settled. There was but one feature connected with the conduct of the company's business so far as the safety of the miner was concerned that attracted our attention, and that was the employment of a hoisterman who could not speak or understand the English language. This occurred to us as unwise, especially where men are being lowered and hoisted in a shaft so deep and where so much work is going on continually. The fact that a hoisterman is governed by signals is all well enough, but in event of an accident and something happens the cages, men in their excitement, forget signals and lose valuable time in calling or shouting; if all the men below or working in and around the shaft were of one nationality the danger would not exist.

DOE RUN LEAD CO.

The property of this company is largely owned and controlled by some of the owners of the St. Joseph Lead Company. The Doe Run Lead Company is capitalized at \$1,500,000, and owns 4,000 acres of mineral land, which has been prospected very thoroughly with the diamond drill. Two shafts, of an average depth of 440 feet, have been sunk, from which extensive mines have been opened up, and a large amount of lead ore produced. The mines of this company are located on its lands at Flat River Station, and its reduction works at the town of Doe Run, some few miles further south and the terminus of the M. R. & B. T. R. R. Doe Run is a place of 1,200 inhabitants and owes its existence to the extensive manufacturing and reduction works of the company from which it derives its name. The equipment of this company is first-class in every particular. At its reduction works we find 7 Blake crushers, 41 steam jigs and 8 tables, it has 14 steam boilers at the mines and 7 at the mill; 7 pumps at the mines and 12 at the mill, 2 large air compressors and 3 steam hoisters. It employs 254 men at the mines and 225 at the mill making a total of 479

employees. An electric light plant has been placed at the mill and also at the mines, in fact every modern facility which would add to the comfort, safety and economical conduct of the business has been supplied. During the last 12 years the company has produced in the aggregate 165,387,040 pounds of lead ore, which gives an average for each year in the period of 13,728,287 pounds. The output for this year was 24,580,000 pounds, showing a large increase compared with the above average.

Mr. F. P. Graves, superintendent and secretary of the company, has been its leading spirit, and much credit is due him for the splendid showing which the company makes.

CENTRAL LEAD COMPANY.

This company owns 1,604 acres of land in the great Flat river mineral belt, and it is conceded by many to be the richest section of lead ore deposit in the county. The capital stock of the company is \$1,000,000. Mr. Arthur Thacher is its president, with postoffice address 420 Roe Building St. Louis, Missouri

Prospecting was commenced in 1876 and carried to a depth of 240 feet, but not until 1890 did the company sink a shaft to the ore body, richer ore having been discovered between 360 to 380 feet, the shaft was sunk to that depth. There are now two shafts in operation one of which is working at the 350-foot level, and the other at 380 feet. The plant and equipment of this company was described in our report several years ago at some length, as both were regarded as models worthy of imitation, and we are convinced that the admirable design and completeness of the same have not suffered for want of new and approved appliances. New boilers and an air compressor have been added during the year, and prospecting with the diamond drill has neither diminished in the amount of work done or in its importance. The product of the mine for the year amounted to 13,396,591 pounds.

That the wonderful resources of this county will be further emphasized by the additional developments of the current year, is very evident. Taking into consideration the old mines which were allowed to remain idle for want of capital or the low price of ore and that are now being revived, renewed and made modern, together with the new mines about ready to commence operations, we look for the number of operating mines in the county to be double the number recorded in this report. We will by no means anticipate a corresponding increase in the product, for it takes time to develop mines to the point of producing in quantities like our older mines, but we do anticipate a much larger output than last year and a still greater increase in

the aggregate value, because of the better prices received for lead ore

The following new companies are expected to add very considerable during the coming year to output and values:

THE ST. LOUIS SMELTING AND REFINING COMPANY.

This company has secured possession of the old Taylor mines situated about one mile south of Desloge. The old shaft on this property having been drowned out, the present company has sunk a new shaft to the ore; this had been accomplished last September and while the work of preparing for active operations was being advanced, we were unfortunate at the time of our visit in not meeting a member of the company who could furnish the information needed. We hope in our next report to record not only an account of its equipment, but to show a large production as well.

THE UNION LEAD COMPANY.

This company has secured the property and plant of what was formerly known as the Donnelly Mining Company, embracing 520 acres of land and a 100 ton plant. This mine is about 2 miles southeast of Flat River Station on the M. R. & B. T. R. R. Considerable mining was done here some years since, after which drill holes were sunk, which disclosed the presence of the disseminated ore; this resulted in the sinking of a shaft and mining was carried on until the year 1894, from which time until 1898, the mines were idle. In the latter year further drilling was resorted to, the present company having secured the property and satisfied itself by tests that the ore was present in paying quantities, sunk the old shaft deeper. When we visited the mine the work of renovating and renewing the old plant was progressing, and it was expected the production of ore would commence October 1, 1899. The plant consisted of a 100 ton mill, steam hoister, air compressor and a pumping outfit complete.

The company is composed of St. Louis gentlemen: Mr. Edwin Harrison, president; A. L. Shapleigh, secretary; C. Herrick, consulting engineer; and W. J. Spencer, superintendent.

COLUMBIA LEAD COMPANY.

This is a new company, with new shaft, machinery, buildings, etc. Mr. H. J. Cantwell, president; S. H. Brickey, vice-president; C. S. Rogers, secretary and treasurer; and Alfred Francis, superintendent. St. Louis office, 602 Roe Building, and the mine address, Flat River, St. Francois county, Missouri.

The company owns 920 acres of land adjoining the lands of the Central Lead Company, and the St. Louis Smelting and Refining Company. A shaft 6x18 feet (three compartments) had been sunk to a depth of 305 feet, passing through a rich ore body, this shaft and the mill also are located on the tract of land known as the "Highley Tract." What is known as the "Pim Tract" is also owned by the company, on which prospecting has developed a very large body of comparatively rich ore; this tract is about a mile south from the mill.

The company, when we visited the works, were just completing a 250 ton concentrating plant, with buildings surrounding the same constructed with a view to supplying every needed facility in the most expeditious manner possible. The buildings, machinery, appliances and design of all are after the most modern and approved plans. It was expected that the mine would be opened up and producing before the close of the year 1899.

A strong company financially as we learn, has been prospecting in this county along Big river, thence over into Washington county. The mining engineer connected with this company informed me that a shaft would be sunk on what was called the "Derby Track," the work to commence about December 1st.

While visiting the mines of St. Francois county, special inquiry was made of the miners employed at different mines in order to arrive at the correctness of some complaints that were circulated in high places. We either met the wrong man in each instance or the complaints got lost. The employes of the St. Joseph Lead Company at Bonne Terre, demanded compliance with the eight hour law, to which the company willingly assented, but with the understanding that the price paid per day would be reduced to equalize the difference in time. As the men preferred the full pay the matter was dropped.

At the mines of the Desloge Lead Company, the miners demanded same rate per day that was paid at Bonne Terre, there appearing to be some difference in the prices paid at the respective places, the miners came out on a strike. The operators promptly met the demand and work was resumed.

The miners of southeast Missouri generally complain of what they claim is the unreasonable difference in the prices paid miners in their section compared with the Joplin district or southwest Missouri. Where legislation fails to regulate or harmonize differences of this nature, there was nothing left us but to venture a suggestion and give a reason for better prices in the southwest, by reminding the miners that in their county there were but four companies, and each one of them powerful financially and otherwise, with interests identi-

cal, and that the comparative ease with which they could arrive at an understanding with each other, virtually in any controversy arising between operators and miners amounted to an array of 1,400 employes on one side and one company on the other. Contrast this state of affairs with the Joplin district and we find a totally different condition of things, with her 500 or more operators instead of 4 operators as St. Francois county has. In the Joplin district there are some large companies, but as a rule they do little or no mining; it is the sub-lessee or the small fellow with a shaft or two that hires labor and mines the ore. In the southwest with its 500 operators there is of necessity a diversity of interests that makes it almost impossible to control or harmonize. The added stimulus of an increase in the price of ore in this district makes competition active and wages increase with comparative ease, for the reason, that the sum of the cost of the increase is divided among 500 instead of a few operators, and it does not look so big. If the four operators of St. Francois had under consideration the question of increasing the pay of their employes, to the same figures paid in the southwest, for same class of labor, and it showed as it really does, an increase of \$1,100 per day to be paid their employes in addition to what they were paying, it would scare them out, and yet the same relative increase in the Joplin district would stand each operator only \$7.50 per day. The southwest district is rapidly accumulating big companies and when they have secured the most valuable tracts of mineral land, the royalty will jump generally, as it has already done in some instances, from 20, 22½ and 25 per cent. to 50 per cent.; then the sub-lessee who does the major portion of the mining will have to reduce the pay of the miners, for there is a limit to the amount that even a sub-lessee of a zinc and lead mine can afford to give away for the privilege of mining on a certain tract of land, and at the same time make a living for himself and pay his employes living wages.

There is no question that all who visit St. Francois county and its mines, will be impressed with the immense proportions of everything connected with them. The absence of anything like mediocrity in any department of work will be especially noticeable. Then the management at each one of the mines is of the highest order and the facilities for doing business are unexcelled. Taken altogether it is safe to state, that no lead ore territory of the same dimensions, yet developed in this wide world, presents anything comparable with the rich and extensive ore bodies; the elaborate and liberally equipped plants; the volume of business, the facilities for handling the same or so brilliant a prospect for the future as may now be found in St. Francois county, Missouri.

WASHINGTON COUNTY.

During the fiscal year just closed mining was stimulated considerably, whether from increased prices paid for ore or because of the renewed excitement concerning mineral lands so prevalent all over this particular section of the state, we cannot say; perhaps it was due to both causes. Large tracts of land in the county have been purchased, leased and optioned during the year. The claim that the disseminated ore similar to that of St. Francois county had been discovered near Irondale, and the fact that prospecting in that vicinity with the diamond drill was being pushed with five drills in a most systematic and comprehensive manner, created great excitement in all that section. The inspector, during his trip from Potosi to Irondale met many of the farmers along the road; generally they were feeling good and somewhat exercised, as well they might be did all turn out as expected. Many of them had optioned their farms at \$60.00 per acre where but a few months prior thereto, \$10.00 per acre would have been considered an extra good price. We learned before reaching Irondale, that a strong company was at work in that vicinity, and the names given as the parties composing the company were such as to throw some doubt upon the information. Meeting Mr. W. O. Sargent, the mining expert employed by the company, he kindly informed me that he would be glad to furnish me what information he could. He failed to furnish the names of the gentlemen in his company; but informed me that it had acquired leases and options on about 12,000 acres of land located on both sides of Big river from Bellegrade to Randolph in St. Francois county, and thence on to Irondale and beyond; that the company had regularly employed five diamond drills, and up to that time had sunk 46 drill holes; that the Derby tract of land in St. Francois county, containing 1,600 acres of land, had been purchased and prospected, and that about November 1st, the work of sinking a shaft on the property would be commenced. Mr. Sargent says that there is nothing to bear out the idea that the disseminated ore is in the cambrian formation, as the ore-bearing rock of St. Francois county ante-dates fossils and for this reason is distinct and needs classification.

At Potosi, Mineral Point, Richwood, Old Mines and Palmer mining has been carried on many years. At Old Mines and the Renault mines near Palmer it is claimed that mining was commenced as far back as 1725. A large amount of lead has been mined in this section

and the small shafts, diggings and openings are very numerous, but the indifferent and crude methods which have obtained, makes it difficult to describe them except in a general way. A great amount of mining has been done in shallow pits in the clay, others have followed crevices and in many other instances shafts have been sunk, in some cases as deep as 140 feet, in which the sheet lead was found running in channels parallel to each other, and they in turn crossed by other channels; these channels vary in width and usually carry lead associated with barite. Zinc ore is found in deposits quite often, sometimes blende, but more generally oxidized silicates.

In the neighborhood of Potosi large bodies of land containing mineral are owned by individuals. Mr. Geo. D. Bolton, of Chicago, owns 8,600 acres, which adjoins Potosi. This land is worked by farmers and miners who are required to deliver the ore to Mr. Bolton's agent at Potosi, who weighs the same and after deducting the royalty, the small operator is paid one-half cash and the remainder in merchandise. The operations are numerous, but all conducted in a small way; there are several smelters operated and usually the proprietors of the same own large tracts of land, on which a miner may operate and deliver his product to the smelters, a royalty is charged and deducted from the value of the ore. For this reason the inspector is compelled to look to the smelter or agent of a large property for the returns each year.

The diamond drill has been actively employed by Mr. E. W. Ellis near Potosi, and we understand he is now located at the Renault mines near Palmer. Should he discover the disseminated ores found in St. Francois county in the section he is now prospecting, he will be entitled to great credit for his courage and untiring efforts. The benefits accruing as the result of a rich find of disseminated ore, in a section where mining has been carried on for so many years with such indifferent success, cannot easily be measured. The disseminated ore is, no doubt, to be found in the county.

We are indebted to Mr. Hugh McGregor, of Potosi, for kindness shown and for his assistance in piloting us about the mines in his vicinity. We are also under obligations to Mr. W. J. Elledge for assistance in securing returns from shippers.

This county is the greatest producer in the state of barite; the principal shippers and points of shipment are as follows:

The Shibboleth Lead Mining Company, at Cadet, Mrs. L. D. Bone, of Mineral Point, Chadbourne & Long of Old Mines, and Hugh McGregor of Postosi.

Shipments of barite were made this year as follows:

From Blackwell	1,530 tons
From Cadet	11,323 tons
From Hopewell	150 tons
From Mineral Point	3,125 tons.
From Old Mines	1,545 tons
From Potosi	2,975 tons
Total.....	20,648 tons

MADISON COUNTY.

Before the French, in 1720, discovered the lead ore of this county, it is claimed the Chickasaw Indians had been working the mines and disposing of the lead to the early explorers. For many years following the ore was considered public property. In 1744 Francois Valle received a grant from the Spanish government of 34,999 acres, which embraced all the lands which has for so many years been known as Mine La Motte. From 1875 until the last year this property has been owned by Rowland Hazard. The last report made from Mine La Motte indicates that S. H. Leathe, of St. Louis, is the present owner. This same report gives the number of acres in the tract as 33,800 and the number of acres of workable mining land at 3,000, and the value of plant and land \$600,000.

It is estimated that Mine La Motte has produced all told 117,180 tons of lead. For the year ending June 30, 1889, there was produced on this property 2,875 tons of lead, 64 tons of nickel and cobalt, and 1.100 tons of iron ore. The plant consists of one concentrating plant, 9 stam boilers, 15 steam pumps, electric power for drilling, 4 stem and 1 hydraulic hoister, 3 crushers and 14 slime tables. Mining heretofore has been confined almost exclusively to a few miles square. Much surface mining has been done here, but the principal mining is done by sinking shafts to the disseminated ore-bearing rock in which at times the ore is so abundant as to constitute a large part of the rock and then again it is scattered in small grains.

JEFFERSON COUNTY.

This is the only county in the southeast portion of the state that has produced any great quantity of zinc ore. To the present the aggregate product reaches 62,344 tons, mostly carbonate, the blende heretofore being quite rare. Lead ore has been mined for over a hundred years, and the Valle Mines have been steady producers since 1824. The Valle Mining Company has an investment of \$200,000 in its plant and mineral lands, the latter embracing 5,082 acres, located in both

Jefferson and St. Francois counties. The ore is found and mined in a manner very similar to that described in Washington County.

From the general appearances and new developments to be seen in Jefferson county, it is one of the coming mineral producing counties of the state. There are quite a number of new developments in various portions of the county of lead and zinc ore which are showing well and it would appear that only depth is necessary to be gained when profitable ore bodies will be encountered. About one-half mile to the north of Hillsboro, Dr. Louis Camp has been prospecting on his farm and at the depth of thirty-five feet, he has a very good showing of both lead and zinc ore developed in hard ground. From indications and developments already made, there will doubtless be opened up a profitable body of ore when a greater depth is reached.

About four miles to the northwest of Hillsboro, Jos. J. and R. G. Hoekin, Judge F. R. Dearing, of Hillsboro, Mo., and Hon. Sam. Byrns, of DeSoto, Mo., own a tract of mineral land which they are developing and cleaning out an old shaft which was sunk before or during the war, in which rich lead ore is said to have been developed at the depth of eighty-five feet. Their shaft at date of inspection, October 4, 1899, was down seventy-five feet. They had in operation a steam hoister and a small lift pump. They have leases on other lands near and will spend several thousand dollars prospecting.

THE SANDY MINING COMPANY.

The Sandy Mining Company is situated about five miles west of Hillsboro, and operates a forty acre lease at a royalty of ten per cent, the land being owned in fee simple by G. J. Johnson. The company is composed of E. Meysenburg and Dr. Park, of Grafton, Ill., W. Voughton, G. J. Johnson and J. G. Warne, of Jarvis, Mo. They have four shafts sunk ranging in depth from forty to 112 feet with good lead ore developed in one shaft at the depth of forty feet, and lead and zinc ore developed in one of the other shafts at 112 feet below the surface. The ore occurs in medium hard ground and is showing up well. Their improvements consist of a steam hoister for hoisting purposes and two lift pumps with which the ground is drained. The works are under the management of Mr. Warne.

FRANKLIN COUNTY.

Like the counties adjoining south and east, mining has been engaged in for many long years and much ore produced. Heretofore the

methods employed in securing the best results are responsible largely for this county showing so indifferently in its output of ore. Mining here is confined mostly to vertical crevices or veins, some of which are fissure veins. At present there appears a more determined effort on the part of operators to carry on operations in a more systematic way than formerly attempted. The new life which has developed in the mining interest in this section within the last year gives promise of flattering results. Following in brief is a description of the new enterprises, together with the names of the operators:

Joseph Bennett, with postoffice at Sullivan, owns 838 acres of land in sections 1 and 2, township 41, range 2 west, and section 36, township 42, range 2 west. He has 4 shafts sunk to a depth on an average of 30 feet. The work so far has been one of prospecting simply; he has uncovered two strong veins of silicate and zinc sulphide and also a lead fissure, producing out of his prospect shafts 15 tons of zinc, 25 tons of silicate and $3\frac{1}{2}$ tons of lead.

Chimney Mining Company. R. W. McGuire, president and S. A. D. Stinger, superintendent. This company has an investment of \$10,000, owns 126 acres of land in section 31, township 41, range 1, west. The company has an equipment consisting of a concentrating plant, two hand jigs, one steam boiler, two steam pumps and a steam hoister. Shaft has been sunk to a depth of 128 feet in a chimney, from which there has been mined 50 tons of lead.

Enterprise Mining Company, address 704 Chestnut street, St. Louis. Capitalized at \$16,000, own 73 acres in section 30, township 41, range 1, east, and has an equipment embracing concentrating plant, hand jigs, steam boiler, pump, hoister and crusher. The company has three prospecting shafts going down with the prospect growing brighter with increased depth. The three shafts each show good lead, with a vein of pure lead from 2 to 18 inches in width. The distance from shaft No. 1 to No. 3, is about 400 feet and connected by a drift at the 80-foot level. The output for the year was $243\frac{3}{4}$ tons of lead.

Northumberland Mining Company. Mr. Chas. H. Filley, secretary, Fullerton Building, St. Louis. The company owns 90 acres of land in sections 5 and 32, townships 41 and 42, range 1, east. This is a new company organized February 23, 1899, and the work confined to prospecting so far. Three shafts, 50, 60 and 150 feet respectively, have been sunk and some 40 tons of lead taken out while sinking. One concentrating plant, one hand jig, boiler, pump and hoister constitute the equipment.

Sangs Mine, operated by Standifer & Pierce. This concern has leased 80 acres of land in section 2, township 41, range 1, east. There is a small concentrating plant with boilers, pump and hoisting apparatus in use, and one shaft down to the depth of 85 feet with the intention of sinking to the 150-foot level. The shaft is sunk on what is thought to be a true fissure vein from 14 to 38 inches wide. It is claimed that thirty-five per cent. of the material taken out is lead ore.

In the counties of Benton, Camden, Christian, Cole, Dade, Douglas, Greene, Hickory, Howell, McDonald, Miller, Morgan, Taney and Webster, mining has been carried on in a desultory way for many years. The present, however, shows a much greater activity in development than has heretofore been experienced; the methods employed and the manner of prospecting are much more systematic than formerly. All of which give promise of demonstrating the true value of the mineral deposits in the respective counties. So far, that stage of development has not been reached that warranted the inspector in giving his time, further than to note the progress made, as his limited time and opportunities permitted. There is no question that a more comprehensive and detailed report of the work going on in each of the above named counties would be beneficial; but with the very meager appropriation at the disposal of the inspector, and the large number of producing mines in other counties that must be looked after, and no field assistant, it was utterly impossible to give attention to mines other than those that were regular producers.

It is not within the province of the inspector to visit and express his opinion upon the possibilities of any particular section where prospecting is going on, he having to do only with mines that have been developed and that are producing ore. The State Geologist will furnish the data by which a prospector may be governed in his judgment of what constitutes a true mineral district, where the conditions are conformable and favorable. The prospector at times strikes a formation totally at variance with the accepted theories relative to certain sections, but the fact should not be lost sight of, that occurrences of this nature are due to local disturbances; the upheavals, depressions, folds, faults, crevices and fissures when investigated very often reveal unexpected things, and they are sometimes very disappointing in the search for treasure.

In our next issue we hope to record many new and productive mines in several of the counties mentioned above. Operators in new fields and also prospectors are respectfully requested to advise us of new finds and the opening of new mines; at the same time we will be glad to furnish them any information in our power.

TRIPOLI.

This is a product of Newton county, and growing in usefulness and importance with each year.

Tripoli is used in the form of powder as an abrasive, and forms the base for many polishing pastes. It is also mixed with nitro-glycerine, and in the manufacture of dynamite. It also makes a most excellent filter, and is very largely used for this purpose.

There are several companies engaged in the manufacture of filters and other articles, and in grinding the tripoli to powder for use in polishing metals, etc.

We were unable to learn what quantity of the mineral was used in the manufacture of various articles, but find that 5,920,000 pounds of the raw material was shipped from Newton county during the year.

BARITES.

This mineral is used chiefly as an adulterant. When ground it is a pure white, tasteless powder, heavier than lead and very cheap; it is mixed with white lead, sugar, candies, etc. After being colored with chrome yellow, it is used as a wash for the canvas covering placed on hams and breakfast bacon.

Shipments were made chiefly from Blackwell, Cadet, Hopewell, Mineral Point, Old Mines and Potosi, in Washington county.

From Spring Garden, Olean and Eldon in Miller county.

Cole county ships from a station in Miller county and through the kindness of Mr. E. A. Becker, of Spring Garden, who purchases the product from Cole, we are enabled to furnish its output. For the past year the shipments have been:

Cole County	540 tons
Miller County	620 tons
Washington County	20,648 tons
Total.....	21,808 tons

IRON.

The shipment of iron ore for last year, as reported from Crawford, Dent, Madison and Phelps counties, aggregates 17,220 tons.

Dent county shipped in addition to her 14,960 tons of iron ore, 9,040 tons of pig iron.

From reports received it is probable that Howell county will furnish, during the current year, a larger iron ore product.

TABLE 11.

Showing by counties, plant, employees, tonnage, prices and value of the lead and zinc product of Missouri for the fiscal year ending June 30, 1899.

Counties.	Number of shafts.....	Average depth of shafts.	Machinery in use during the year.									Employees, including prospectors.				
			Boilers.....	Pumps.....	Air-compressors	Steam holsters..	Horse holsters...	Crushers	Steam jigs.....	Hand jigs.....	Concentrating plants.....	Hand jig plants..	Miners.....	Other employees.	Prospectors.....	Total number of men employed.
Barry.....	5	42	1	1.....	1	7	2	10	4	1	2	37	8	35	80	
Christian	2	82	1	1.....	1	2	1	6	2	.....	.....	7	4	2	13	
Cole prospect shafts.....	11	70	4	3.....	2	3	.....	.....	6	.....	.....	22	15	17	54	
Franklin.....	5	96	4	5.....	4	.....	2	.....	7	.....	4	48	20	26	94	
Howell.....	2	30	2	3.....	.....	1	.....	.....	2	.....	.....	15	7	4	26	
Jasper.....	539	120	507	340	24	358	351	208	313	553	176	340	3,982	1,865	842	6,689
Jefferson	75	100	1	.....	.....	15	.....	.....	.....	2	2	.....	60	10	6	76
Lawrence.....	60	96	36	31	1	38	22	15	61	74	11	44	382	181	120	683
Madison.....	3	120	9	15.....	5	.....	.....	1	10	.....	1	.....	130	240	20	380
Miller, prospect shafts.....	7	48	2	.....	.....	1	4	.....	.....	2	.....	.....	6	10	15	31
Morgan, prospect shafts.....	8	52	2	2.....	2	.....	2	1	.....	4	.....	3	14	17	2	33
Newton.....	76	86	74	51.....	61	37	19	28	91	9	50	303	210	154	757	

TABLE II—Continued.

Counties.	Zinc ores produced.					Lead ore produced.					Total amount received for both lead and zinc ore.
	Tons of zinc ore mined.	Tons of silicate mined.	Average price received for zinc.	Average price received for silicate.	Value of all zinc ore.	Tons of lead ore mined.	Tons of dry-bone mined.	Average price received for lead.	Average price received for dry bone.	Value of all lead ore.	
St. Francois.....	2		\$40.00		\$80	49,057 $\frac{3}{4}$		\$43.92		\$2,120,154	\$2,120,154
Taney.....						$\frac{1}{2}$		50.00		25	105
Washington.....						1,920 $\frac{1}{2}$		44.21		85,153	85,153
Totals.....	105,841	14,588 $\frac{3}{4}$	34.33	16.99	5,974,024	50,561	298 $\frac{3}{4}$	44.49	24.67	3,146,237	9,120,861

Southwest Missouri lead ore, high grade, sold for an average of \$47.44 per ton.

Southwest Missouri lead, low grade, sold for an average of \$24.67 per ton.

Southwest Missouri lead, all grades, sold for an average of \$47.13 per ton.

Southeast Missouri lead ore, (smelted by operators mining the ore) \$43.52 per ton estimated.

**TABLE III—Average Prices of Pig Lead and Spelter in New York
for the Fiscal Year Ending June 30, 1899.**

Month and year.	Pig lead per 100 pounds.	Spelter—cents per pound.
July, 1898.....	\$3 95	4.66
August, 1898.....	4 00	4.58
September, 1898.....	3 99	4.67
October, 1898.....	3 78	4.98
November, 1898.....	3 70	5.29
December, 1898.....	3 76	5.10
January, 1899.....	4 18	5.34
February, 1899.....	4 49	6.28
March, 1899.....	4 37	6.31
April, 1899.....	4 31	6.67
May, 1899.....	4 44	6.88
June, 1899.....	4 43	5.98
Averages for the year.....	4 12	5.56

TABLE IV.

Zinc, Price of Common Western Spelter in New York, 1875, to July 1, 1889, Inclusive.

[Cents per pound. Figures in parentheses are combination prices.]

Years.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	
1875.....	6.75	6.37	6.25	6.25	6.50	6.20	(7.00)	6.50	(7.25)	7.15	7.15	(7.25)	(7.35)	7.25	(7.25)	7.10	(7.25)	7.10	(7.40)	7.15	(7.40)	7.15	(7.40)	
1876.....	(7.60)	7.40	(7.75)	7.50	7.60	7.62	(8.00)	7.60	(8.00)	7.25	7.25	(8.00)	7.25	7.12	(7.25)	6.80	(7.12)	6.80	6.75	6.82	6.37	6.50	7.15	
1877.....	6.50	6.25	6.62	6.25	6.37	6.37	6.125	6.37	6.125	5.87	5.87	6.12	5.87	5.62	5.90	5.75	5.87	5.90	5.90	5.75	5.50	5.50	7.35	
1878.....	5.75	5.50	6.02	5.25	5.00	4.92	4.38	5.25	4.79	4.25	4.25	4.37	4.75	4.37	5.00	4.50	4.87	4.50	4.82	4.50	4.37	4.25	6.03	
1879.....	4.50	4.25	4.62	4.40	4.25	4.37	4.75	4.25	4.50	4.25	4.12	4.37	4.75	4.37	5.62	4.87	5.02	6.37	6.00	6.25	5.87	6.25	5.036	
1880.....	6.50	5.87	6.75	6.37	6.50	6.50	6.12	6.12	6.00	5.62	5.12	5.00	4.75	4.87	5.25	5.00	5.02	6.37	6.00	6.25	5.87	6.25	5.036	
1881.....	5.25	4.87	5.25	5.12	4.75	4.87	5.12	4.75	5.00	4.75	4.75	5.00	5.00	4.87	5.12	5.00	5.25	5.00	5.00	4.87	4.87	4.65	5.51	
1882.....	6.00	5.75	5.75	5.62	5.62	5.62	5.62	5.25	6.00	5.62	5.25	5.37	5.37	5.12	5.50	5.12	5.37	5.00	5.37	5.25	5.50	6.00	5.243	
1883.....	4.62	4.50	4.62	4.40	4.75	4.75	4.62	4.60	4.75	4.50	4.62	4.60	4.55	4.37	4.60	4.30	4.50	4.40	4.45	4.37	4.37	4.35	5.595	
1884.....	4.37	4.20	4.40	4.25	4.30	4.40	4.65	4.50	4.60	4.45	4.45	4.45	4.45	4.30	4.40	4.30	4.50	4.40	4.40	4.30	4.37	4.00	4.443	
1885.....	4.50	4.30	4.55	4.30	4.60	4.50	4.60	4.50	4.60	4.40	4.35	4.40	4.40	4.30	4.40	4.25	3.92	4.40	4.62	4.50	4.30	4.25	4.545	
1886.....	4.50	4.30	4.60	4.40	4.60	4.40	4.60	4.50	4.65	4.45	4.65	4.40	4.50	4.50	4.60	4.55	4.05	4.60	4.65	4.50	4.25	4.50	4.625	
1887.....	5.37	5.20	5.35	5.25	4.87	4.87	4.87	4.60	4.65	4.60	4.60	4.60	4.55	4.50	4.87	5.40	5.12	4.75	5.12	4.87	4.87	5.12	4.87	
1888.....	5.00	4.95	5.25	5.25	4.75	4.75	4.675	4.75	4.75	4.75	4.975	4.975	5.10	5.10	5.20	5.175	5.175	5.10	5.10	5.20	5.40	5.023	5.50*	
1889.....	5.41	5.25	5.45	5.45	5.137	5.137	5.065	5.35	5.35	5.35	5.315	5.315	5.58	5.58	5.70	5.600	5.600	6.012	6.012	6.122	6.106	6.106	5.85	
1890.....	4.60	4.55	4.625	4.625	4.58	4.58	4.48	4.85	4.85	4.85	5.063	5.063	5.063	5.063	5.01	4.938	4.938	5.02	5.02	4.83	4.75	4.75	5.02	
1891.....	4.36	4.32	4.38	4.38	4.28	4.28	4.38	4.79	4.79	4.79	4.71	4.71	4.78	4.78	4.69	4.63	4.63	4.41	4.41	4.47	4.47	4.47	4.63	
1892.....	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.47	3.47	3.47	3.40	3.40	3.43	3.43	3.38	3.39	3.39	3.68	3.68	3.65	3.89	3.89	4.075	
1893.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.50	3.50	3.50	3.65	3.65	3.75	3.75	3.85	3.84	3.84	3.45	3.45	3.36	3.53	3.53	3.63	
1894.....	3.75	3.75	4.03	4.03	3.98	3.98	4.09	3.98	4.16	4.16	4.28	4.28	4.32	4.32	4.70	4.60	4.60	3.70	3.70	3.86	4.10	4.10	3.93	
1895.....	3.66	3.66	4.019	4.019	4.136	4.136	4.13	4.16	4.16	4.28	4.28	4.28	4.32	4.32	4.70	4.60	4.60	3.70	3.70	3.86	4.10	4.10	3.93	
1896.....	3.86	3.86	4.04	4.04	4.27	4.27	4.23	4.27	4.27	4.27	4.77	4.77	4.86	4.86	4.58	4.48	4.48	4.17	4.17	4.03	3.89	3.89	4.13	
1897.....	3.86	3.86	4.04	4.04	4.27	4.27	4.23	4.27	4.27	4.27	4.77	4.77	4.86	4.86	4.58	4.48	4.48	4.17	4.17	4.03	3.89	3.89	4.13	
1898.....	5.34	5.34	6.28	6.28	6.31	6.31	6.07	6.88	6.88	6.88	5.98	5.98	4.66	4.66	4.58	4.67	4.67	4.98	4.98	5.29	5.10	5.10	4.37	
1899.....	5.00	4.95	5.25	5.25	4.75	4.75	4.675	4.75	4.75	4.75	4.975	4.975	5.10	5.10	5.20	5.175	5.175	5.10	5.10	5.20	5.40	5.023	5.50*	

*Fiscal year ending June 30, 1899.

St. Louis prices are usually .03 below New York prices.

TABLE V—*Showing the Zinc Ore Product of Southwest Missouri from the year 1873 to 1899, Inclusive, Together With the Average Price Received Each Year for the Ore and Total Value of Same.*

Year.	No. of tons.	Average price.	Am't rec'd for output.	Year.	No. of tons.	Average price.	Am't rec'd for output.
1873.....	960	\$9 00	\$8,640 00	1887.....	57,300	\$19 00	\$1,088,700 00
1874.....	5,100	10 00	51,000 00	1888.....	61,550	21 00	1,292,550 00
1875.....	3,600	12 00	36,000 00	1889.....	82,357	21 44	1,765,734 08
1876.....	11,300	13 50	148,000 00	1890.....	100,248	22 51	2,256,583 00
1877.....	10,000	14 00	140,000 00	1891.....	123,752	21 60	2,673,063 36
1878.....	12,000	16 50	198,000 00	1892.....	131,488	21 76	2,862,475 08
1879.....	20,000	17 00	340,000 00	1893.....	108,591	20 57	2,245,028 80
1880.....	27,500	16 00	440,000 00	1894.....	89,150	15 00	1,337,910 36
1881.....	35,500	16 50	579,150 00	1895.....	101,294	16 86	1,707,665 40
1882.....	34,900	16 90	589,100 00	1896.....	92,754	19 75	1,831,856 45
1883.....	35,700	17 50	624,750 00	1897.....	93,148	18 62	1,706,947 53
1884.....	43,200	18 00	777,600 00	1898.....	139,668	20 96	2,927,321 00
1885.....	42,200	17 50	738,500 00	1899.....	181,430	32 93	5,974,624 00
1886.....	48,400	18 50	895,400 00	Totals	1,695,790	20 79	35,236,599 00

In the above table the last nine years are our fiscal years, ending June 30.
The average price includes all grades of ore.

EMPLOYEES, EQUIPMENT, TONNAGE AND VALUE—Continued.

BARRY COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Employees.			Average wages paid,.....	No. of men prospecting....	Zinc ores.			
			Miners.....	Other employees.....	Total.....			Tons zinc ore mined..	Tons silicate mined..	Prices receiv'd For zinc.....	For silicate.....
1	Mariott & Berry.....	Mariott & Berry.....	2	3	5	\$1 25	23	128	128		\$14 00
2	Pioneer Mining & Milling Co.....	R. Stevens.....	35	5	40	1 75	12	120	120	\$30 00	12 00
	Totals.....		37	8	45	1 69	35	15	248	30 00	13 03

BARRY COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.			Am't received for output of both lead and zinc.....
			Tons lead ore mined.	Tons dry-bone.....	Prices receiv'd Lead ore.....	
1	Mariott & Berry.....	Mariott & Berry.....	1-5		\$50 00	\$1,802
2	Pioneer Mining & Milling Co.....	R. Stevens.....	27		44 00	3,088
	Totals.....		27	1-5	44 04	4,890

[illegible]

CHRISTIAN COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.			Am't received for		Total amount received for output of both lead and zinc.....
			Tons lead ore mined..	Tons dry-bone	Prices receiv'd	Lead product.....		
1	New Era Mining Co.....	New Era Mining Co.....	7½	3	\$44 00	\$300	\$430	\$830
2	Oaks, Wm.....	Wm. Oaks.....	15½	3	44 00	.....	736	736
	Totals.....	.....	23	3	44 00	300	1,066	1,366

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

FRANKLIN COUNTY.

Name of mine, talcowner or company.	Name of present operator.	Machinery in use.									
		No. of hand jig plants	No. of concentrating plants	No. of hand jigs	No. of steam jigs	No. of crushers	No. of horse hoisters	No. of steam hoisters	No. of air compressors	No. of steam pumps	No. of boilers
		Average depth of shaft	No. of shafts operated	Capital invested in land and plant	Acres of land leased or owned						
Bennett, Joseph H.	Jos. H. Bennett	30	1	\$10,000	88						
Chimney Mining Co.	Chimney Mining Co.	125	1	16,000	126						
Enterprise Mining & Realty Co.	Enterprise Mining & Realty Co.	90	1	75,000	73						
Northumberland Mining Co.	Northumberland Mining Co.	170	1	1,150	90						
Sango Mine	Standifer & Pierce	85	1		80						
Totals		95	5	102,150	1,207						

See number

FRANKLIN COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Employees.		No. of men prospecting.....	Zinc ores.		Tons zinc ore mined..	Tons silicate mined..	Prices receiv'd	
			Miners.....	Other employees.....		Total,.....	For zinc.....			For silicate.....	
1	Bennett, Joseph H.....	Jos. H. Bennett.....	3	1	4	15	25	\$34 00	\$16 00		
2	Chimney Mining Co.....	Chimney Mining Co.....	15	5	20	20					
3	Enterprise Mining & Realty Co.....	Enterprise Mining & Realty Co.....	20	5	25	20					
4	Northumberland Mining Co.....	Northumberland Mining Co.....	8	14	22	6					
5	Sango Mine.....	Standifer & Pierce.....	21	3	24	2					
	Totals....		48	20	68	15	25	34 00	16 00		

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

FRANKLIN COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present owner.	Lead ores.			Am't received for		Total amount received for output of both lead and zinc.....
			Tons lead ore mined..	Tons dry-bone.....	Prices receiv'd	Zinc product.....	Lead product.....	
1	Bennett, Joseph H.....	Jos. H. Bennett.....	3½	.....	.....	.....	.....	\$1,085
2	Chimney Mining Co.....	Chimney Mining Co.....	50	.....	\$50 00	.....	\$175	2,500
3	Enterprise Mining & Realty Co.....	Enterprise Mining & Realty Co.....	243 3-4	.....	44 00	.....	10,911	10,911
4	Northumberland Mining Co.....	Northumberland Mining Co.....	40	.....	50 00	.....	2,000	2,000
5	Sango Mine.....	Standifer & Pierce.....	42½	.....	48 00	.....	2,040	2,040
	Totals.....		379 3-4	.....	46 61	910	17,626	18,536

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

COLE, HOWELL, MILLER AND TANEY COUNTIES.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Acres of land leased or owned.....	Capital invested in land and plant.....	No. of shafts in operation ..	Average depth of shaft.....	Machinery in use.									
							No. of boilers.....	No. of steam pumps ..	No. of air compressors	No. of steam hoisters.	No. of horse holsters.	No. of crushers.....	No. of steam jigs.....	No. of hand jigs.....	No. of concentrating plants.....	No. of hand jig plants.
1	Cole county.....	Prospect shafts.....	940	\$17,000	9	40	4	3	3	2	3	3	...	6	...	4
2	Howell county.....	"	280	3,200	2	77	2	3	...	...	1	...	...	...	1	1
3	Miller county.....	"	1,750	2,100	2	30	2	...	...	...	...	...	...	2	...	...
4	Taney county.....	"	339	1,000	3	48	2	...	...	1	4	...	...	...	...	...
	Totals.....	.....	3,309	23,300	23	16	8	6	...	3	8	...	...	10	1	5

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.
 COLE, HOWELL, MILLER AND TANEY COUNTIES—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.			Am't received for		Total amount received for output of both lead and zinc.....
			Tons lead ore mined..	Tons dry-bone.....	Prices receiv'd	Zinc product.....	Lead product.....	
					Lead ore.....			
					Dry-bone.....			
1	Cole county.....	Prospect shafts.....	61 $\frac{1}{2}$		\$46 25	\$1,122	\$2,844	\$3,966
2	Howell county.....	"	42		45 75	6,000	2,005	6,000
3	Miller county.....	"	$\frac{1}{2}$		50 00	80	2,25	2,005
4	Taney county.....	"						
	Totals.....		104		47 00	7,202	4,874	12,076

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114	Willpus Wolpus.....	8	750	1	100	1	1	1	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8</
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30	Columbia Mining Co.	10	102.00	24	290	32	90
31	Connecticut Mining Co.	6	62.00	14	743	14	00
32	Crown Point Mining Co.	20	322.00	5	271	28	00
33	Delaware Lease.	3	81.75	10	1,750	32	50
34	Davey & Son.	60	802.00	2	178	43	00
35	East Hollow Mining Co.	14	212.00	2	351.60	34	02
36	Eastern Stai Mining Co.	8	132.00	2	351	36	00
37	Eldorado Mining Co.	33	732.00	6	6,177.4	34	00
38	Eldorado Mining Co.	100	130.25	2	183.31	97	67
39	Empire Zinc Co., Eagle mines.	12	223.25	25	4,168	35	48
40	Empire Zinc Co., Kollinoor mines.	141	223.25	3	64.4	30	71
41	Empire Zinc Co., Gray lease.	6	131.50	3	135	40	00
42	Emma Lead and Zinc Co.	40	65.25	3	135	30	00
43	Eureka Mining Co.	3	312.00	10	1,238.4	32	12.4
44	Expansion Mining Co.	3	312.00	1	1,666	34	75
45	Free Colnape Mining Co.	30	312.25	1	2,230.3	32	12.4
46	Frye Mines, Beacon lease.	30	452.00	1	1,666	33	00
47	Funk, Bowman & Co.	6	612.00	1	27	24	40
48	Gate City Mining Co.	15	232.00	5	150.7	29	90
49	Granby Mining and Smelting Co.	220	540.25	24	18,985	35	30.4
50	Granby Mining and Smelting Co., Joplin.	250	852.00	30	3,507	38	12
51	Ground, J. W.	20	302.00	8	100	34	00
52	Hagardon & Rose.	25	352.00	20	426	35	35
53	Hannum & McElroy.	30	402.00	6	1,095.2	39	19
54	Hawkeye Mining Co.	15	302.00	6	180	41	10
55	Herold Fred.	25	352.00	15	510	28	47
56	Holden Bros. Mining Co.	15	612.00	15	120	39	42
57	Homestead Zinc & Lead Co.	6	182.12 1/2	4	32.2	39	65
58	Homestead Zinc & Lead Co.	20	302.00	4	32.2	42	00
59	Idaho Mining Co.	37	402.00	12	114	36	65
60	Idaho Mining Co.	20	402.00	4	1,757.4	34	71
61	Indian River Rye Mining Co.	37	402.00	2	391.4	31	46
62	Iowa Consolidated Mining Co.	8	262.00	398	30	09	
63	Ishpurring Mining Co.	7	152.00	45	451	30	00
64	Jasper Lead & Zinc Co.	20	302.00	435.1	38	00	
65	John Jackson Investment Co.	10	302.00	2	2,911.2	34	87
66	Joplin Brewery Mining Co.	40	502.00	2	2,911.2	43	00
67	Joplin Prospecting Co.	4	82.25	30	1,379	34	52
68	Keystone Zinc Co.	35	652.00	18	300	40	00
69	Keystone Zinc Co.	20	702.00	12	1,096	37	00
70	Leonard Mercantile & Realty Co.	50	152.01	6	2,799.4	35	73
71	Lewis, J. F.	10	642.00	6	1,751	31	18
72	Lone Elm Mines.	40	502.25	3	103	33	00
73	McKinley Mining Co.	4	152.50	323	35	87	
74	Manhattan Mining Co.	15	212.00	70	3,026.2	18.2	9.79
75	Massachusetts Lead & Zinc Co.	150	340.20	20	5,799.4	32	86
76	Missouri Lead and Zinc Co.	190	240.20	8	13	24	00
77	Missouri Zinc Fields Co.	230	82.00	5	219	36	66
78	Moosha Mining Co. (Limited).	4	101.75	8	70	39	00
79	Moonsblue Mining Co.	7	62.25	1	293.4	36	00
80	Mount Ararat Mining Co.	4	182.00	1	1,563.7	37	45
81	Narragansett Lead and Zinc Co.	8	62.00	10	1,563.7	37	45
82	New Horse Shoe Mining Co.	4	160.20	4	1,563.7	37	45
83	North Heights	140	160.20	10	1,563.7	37	45

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Employees.		No. of men prospecting.....	Zinc ores.		
			Miners.....	Other employees.....		Tons zinc ore mined..	Tons silicate mined..	Prices received For zinc..... For silicate.....
84	Oakdale Mining Co.....	J. C. Hayden.....	36	14	50	333	.....	43 00
85	O. N. O..... Mining Co.....	Edward Miller.....	6	2	8	20	.....	30 00
86	Pearl "C." Mining Co.....	Pearl "C." Mining Co.....	22	18	40	1,407	.....	24 60
87	Perry, E. N.....	E. N. Perry.....	12	2	14	461	.....	24 90
88	Pleasant Valley Mining Co.....	Pleasant Valley Mining Co.....	30	10	40	1,500	10	40 00
89	Porto Rico Mining Co.....	Schaeffer, Carrick & Frazier.....	4	2	6	.....	.....	.....
90	Plutoerat Mining Co.....	R. H. Branch.....	10	10	20	79	.....	31 00
91	Quartette Mining Co.....	Quartette Mining Co.....	5	5	10	47½	.....	36 25
92	Rabbits Foot.....	Schultz & McAllister.....	10	9	19	46	.....	41 74
93	Reagan Lease.....	J. A. Mitchell & Co.....	10	6	16	97½	.....	33 64
94	Red Plant Mining Co.....	Jack Forty.....	6	4	10	38	.....	26 73
95	Rex Mining and Smelting Co.....	McNuligh, Brownlee Mining Co.....	11	6	17	486	.....	36 50
96	Roaring Springs Land and Mining Co.....	Rex Mining and Smelting Co.....	65	2	67	.....	.....	35 86
97	Robertia Mining Co.....	Roaring Springs Land and Mining Co.....	15	25	40	588	.....	40 00
98	Short Creek Mining Co.....	W. B. Kane.....	30	5	35	400	.....	28 00
99	South Carthage Mining Co.....	Short Creek Mining Co.....	150	100	250	4,465	.....	35 00
100	South Free Coinage Mining Co.....	South Carthage Mining Co.....	15	5	20	464	.....	29 50
101	South Joplin Lease Mining Co.....	South Free Coinage Mining Co.....	10	5	15	158	.....	29 50
102	Sphinx Mining Co.....	South Joplin Lease and Mining Co.....	9	9	18	856½	.....	33 82
103	Spring River Mining Co.....	Sphinx Mining Co.....	10	12	22	914½	.....	31 74
104	Stucky Mining Co.....	Spring River Mining Co.....	35	30	65	1,102	.....	43 00
105	Taylor & Boggy Mining Co.....	C. Stucky.....	30	20	50	127	.....	36 00
106	Texas Star Mining Co.....	Taylor & Boggy.....	5	3	8	75	.....	36 00
107	Three Friends Zinc Mining Co.....	Simpson, Summers, Elliott & Dennison.....	12	5	17	15	.....	35 50
108	Top Run Mining Co.....	Three Friends Zinc Mining Co.....	50	25	75	2,200	.....	32 18
109	Troup Mining Co.....	Malone Peel & Hinton.....	30	12	42	774	.....	42 90
110	Wheeler, Shelter K.....	Troup Mining Co.....	3	4	7	1,983½	.....	28 16
111	Weyman, Henry New Pearl "G".....	John Carter.....	15	5	20	38¼	.....	28 16
112	Wilgus, A. B.....	Henry Weyman.....	3	4	7	75	.....	35 00
113	Wilgus, A. B.....	A. B. Wilgus.....	20	8	28	167	.....	20 00

[illegible]

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.		Am't received for		Total amount received for output of both lead and zinc.....
			Tons lead ore mined.	Prices rec'd	Zinc product.....	Lead product.....	
			Tons dry-bone.....	Lead ore.....	Dry-bone.....		
1	Ajax Lead and Zinc Co.....	Ajax Lead and Zinc Co.....	435	49 00	21,019	21,315	42,334
2	Allen Mining Co.....	Allen Mining Co.....	375%	46 50	4,357	17,472	4,357
3	American Zinc, Lead and Smelting Co.....	American Zinc, Lead and Smelting Co.....	23%	49 00	11,100	1,104	28,572
4	"	"	23%	48 00	21,032	4,118	22,216
5	"	"	233%	50 00	167,442	14,707	171,890
6	Aunt Patty Mining Co.....	H. H. Gregg	112%	50 00	27 00	3,600	14,70
7	Badger State Mining Co.....	Badger State Mining Co.....	20%	49 04	18,300	1,009	3,600
8	Bailey Stickney Mining Co.....	Bailey Stickney Mining Co.....	618%	55 89	69,462	28,307	17,309
9	Bartlett Mining Co.....	Bartlett Mining Co.....	3%	50 00	7,000	1,753	96,328
10	Basson, Fred.....	Fred Basson.....	294%	46 04	6,148	13,725	7,175
11	Becky Sharp Mining Co.....	Becky Sharp Mining Co.....	491%	47 00	60,660	23,100	19,871
12	Beckwith Hall Mining Co.....	Beckwith Hall Mining Co.....	11%	47 00	60,362	611	83,790
13	Big Kate Mining Co.....	Big Kate Mining Co.....	8	50 00	2,616	403	9,963
14	Black City Mining Co.....	S. C. Edgar	5%	44 28	1,064	408	2,616
15	Blue Wing Mine.....	Bob Moore Mining Co.....	118%	44 20	25,708	5,254	26,023
16	Bob Moore Mining Co.....	St. Paul Mining Co.....	12%	44 42	31,226	5,264	36,490
17	Bolen Lead and Zinc Co.....	Boqua Mining Co.....	156	51 50	6,353	6,644	6,979
18	Boqua Mining Co.....	Boston Duenwig Mining Co.....	544%	44 00	153,000	6,864	302,086
19	Boston Duenwig Mining Co.....	Boston Duenwig Mining Co.....	807	48 00	176,068	38,130	170,886
20	Boston Get There Zinc Co.....	Boston Get There Mining Co.....	111%	47 46	132,566	38,300	23,227
21	Boston and Missouri Mining Co.....	Boston and Missouri Mining Co.....	247%	48 00	17,875	5,352	23,227
22	Boston Providence Zinc Co.....	Boston Providence Zinc Co.....	2	51 00	239,761	12,703	252,524
23	Bright Light-Bennett & Hannum.....	Bennett & Hannum.....	63%	46 00	4,250	92	4,342
24	Brunco Mining Co.....	Brunco Mining Co.....	497%	46 00	17,961	3,062	21,023
25	Center Creek Mining Co.....	Center Creek Mining Co.....	8%	48 00	205,961	22,935	228,886
26	Center Valley Lead Zinc Co.....	Center Valley Lead & Zinc Co.....	371%	46 10	129,978	372	127,350
27	Central Mining Co.....	Cloverdale Zinc Co.....		45 00	188,900		188,900
28	Chitwood Hollow Mining Co.....	Lessees.....		47 00	18,900		18,900
29					17,460		100,200

[illegible]

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.		Am't received for		Total amount received for output of both lead and zinc.....	
			Tons lead ore mined..	Tons dry-bone.....	Prices received		Zinc product.....	Lead product.....
					Lead ore.....	Dry-bone.....		
84	Oakdale Mining Co.....	J. C. Haydon.....	.....	.....	.....	.....	14,427	14,427
85	O. N. O'Connell Mining Co.....	Edward Miller.....	15	.....	48 00	.....	720	1,320
86	Perry E. N. O'Connell Mining Co.....	E. N. Perry.....	10%	.....	44 00	.....	34,612	35,081
87	Perry E. N. O'Connell Mining Co.....	E. N. Perry.....	40	.....	46 40	.....	11,479	13,937
88	Pleasant Valley Mining Co.....	Pleasant Valley Mining Co.....	.....	.....	.....	.....	60,150	60,150
89	Porto Rico Mining Co.....	Schaeffer, Carlick & Frazier.....	.....	.....	51 50	.....	303	303
90	Plutocrat Mining Co.....	R. H. Branch.....	293 1/4	.....	44 50	.....	2,449	11,815
91	Quartette Mining Co.....	Quartette Mining Co.....	80 1/4	.....	45 50	.....	1,721	3,332
92	Rabbit Foot.....	Schaeffer & McAllister.....	.....	.....	50 10	.....	1,620	1,620
93	Reagan Lease.....	J. A. Mitchell & Co.....	10 1/4	.....	46 40	.....	2,288	3,805
94	Red Plant Mining Co.....	McK. Perry.....	12	.....	50 00	.....	1,018	1,575
95	Rex Mining & Smelting Co.....	McClagh, Brownlee Mining Co.....	37	.....	50 00	.....	17,739	1,850
96	Roaring Springs Land & Mining Co.....	Rex Mining & Smelting Co.....	37 1/4	.....	40 00	.....	103,451	18,427
97	Roberta Mining Co.....	Roaring Springs Land & Mining Co.....	9 1/4	.....	47 00	.....	23,620	121,888
98	Short Creek Mining Co.....	W. B. Kane.....	30 1/4	.....	53 00	.....	11,300	165
99	Short Creek Mining Co.....	Short Creek Mining Co.....	32 1/4	.....	40 00	.....	15,375	4,845
100	South Carthage Mining Co.....	South Carthage Mining Co.....	2 1/2	.....	50 00	.....	13,688	15,900
101	South Free Coinage Mining Co.....	South Free Coinage Mining Co.....	.....	.....	46 50	.....	4,100	125
102	South Joplin Lease Mining Co.....	South Joplin Lease & Mining Co.....	130	.....	.....	.....	28,475	35,100
103	Spring River Mining Co.....	Spring River Mining Co.....	.....	.....	44 00	.....	22,035	25,080
104	Stucky Mining Co.....	C. Stucky.....	5 1/4	.....	50 00	.....	47,380	47,380
105	Stucky Mining Co.....	Taylor & Boggy.....	1 1/4	.....	50 00	.....	4,555	242
106	Texas Star Mining Co.....	Simpson, Summers, Elliott & Dennison.....	11 1/4	.....	50 00	.....	2,700	775
107	Three Friends Zinc Mining Co.....	Three Friends Zinc Mining Co.....	2 1/4	.....	50 00	.....	78,100	375
108	Top Run Mining Co.....	Malone, Peel & Hinton.....	107	.....	45 80	.....	5,483	125
109	Troup Mining Co.....	Troup Mining Co.....	150 1/4	.....	47 00	.....	72,100	4,800
110	Wheeler Shelter, K.....	John Carter.....	20 1/4	.....	48 00	.....	54,450	7,344
111	Wheeler Shelter, K.....	John Carter.....	20 1/4	.....	48 00	.....	1,021	954
112	Wheeler Shelter, K.....	Wheeler Shelter, K.....	20 1/4	.....	48 00	.....	2,045	3,610
113	Wheeler Shelter, K.....	A. B. Wiggins.....	7 1/4	.....	40 00	.....	4,108	3,340

114	Willipus Wollopas.....	McMillens & McWilliams.....	14 7/8	30 3/4	46 02	20 22	8,979	8,979	11,725
115	Witch-Hazel Mining Co.....	Witch-Hazel Mining Co.....	53	.....	44 08	.....	2,960	694	3,653
116	Wright Mining Co.....	Yale, O'Brien & Ziedler.....	15 1/2	.....	45 50	.....	18,405	10,817	29,222
117	Yale & O'Brien.....	Yale & O'Brien.....	237 1/4	.....	.....	.....	.....	.....	.....
	Totals.....	.....	14,353 1-5	150 3/4	47 40	26 76	4,788,025	688,895	5,476,920

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JEFFERSON COUNTY.

Office number	Name of mine, mine owner or company.	Name of present operator.	Machinery in use.									
			No. of hand jig plants	No. of concentrating plants	No. of hand jigs	No. of steam jigs	No. of crushers	No. of horse holsters	No. of steam holsters	No. of air compressors	No. of steam pumps	No. of boilers
1	Valle Mining Co.	Valle Mining Co.	21	1	21	1	15	15	1	1	100	75
			Average depth of shaft....									
			No. of shafts operated.....									
			Capital invested in land and plant.....									
			Acres of land leased or owned.....									

JEFFERSON COUNTY—Continued.

Office number	Name of mine, mine owner or company.	Name of present operator.	Employees.	Zinc ores.		No. of men prospecting.....	Average wages paid.....	Tons silicate mined ..	Tons zinc ore mined ..	Prices receiv'd	For silicate.....	For zinc.....
1	Valle Mining Co.	Valle Mining Co.	80	10	70	1 50	6	1,200	12 00			
			Total.....									
			Other employees.....									
			Miners.....									

EMPLOYEES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JEFFERSON COUNTY—Continued.

Total amount received for output of both lead and zinc.....										\$25,824	
Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.				Am't received for		11,424	14,400	\$25,824
			Prices receiv'd	Lead product.....							
				Zinc product.....							
				Dry-bone.....							
				Lead ore.....							
Tons dry bone				56 00							
Tons lead ore mined ..				204							
1	Valle Mining Co.....	Valle Mining Co.....									

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

LAWRENCE COUNTY.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Acres of land leased or owned.....	Capital invested in land and plant.....	No. of shafts operated.....	Average depth of shaft.....	Machinery in use.								
							No. of boilers.....	No. of steam pumps..	No. of air compressors	No. of steam holsters.	No. of horse holsters.	No. of crushers.....	No. of steam jigs.....	No. of hand jigs.....	No. of hand jig plants
1	Baptist-Methodist, Nos. 1 and 2	Baptist-Methodist, Nos. 1 and 2	40	\$600	3	80	3	3	.....	3	1	.....	.....	15	15
2	Berry Land	Berry Estate	80	20,000	2	100	1	2	.....	2	1	1	.....	4	2
3	Black Land Mining Co.	Lehnhard, Neuman & Falk	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2
4	Boston-Aurora Zinc Co. (formerly Minor & Rogers)	B. A. Z. Co.	77	7,500	.....	100	4	3	.....	5	2	3	28	6	3
5	Chicago-Aurora Mining Co.	Chicago-Aurora Mining Co.	5	4,000	.....	120	1	1	.....	1	.....	2	1	3	6
6	C. C. Mining Co.	Henry Brumback	15	10,000	.....	185	1	1	.....	1	.....	3	.....	1	1
7	C. C. Mining Co.	Leasees	40	20,000	.....	100	5	5	.....	5	.....	20	.....	3	3
8	Dalbly & Moss	Leasees	40	40,000	.....	61	6	6	.....	3	3	2	.....	6	6
9	Decatur Lead & Zinc Co.	Leasees	20	15,000	.....	12	1	1	.....	1	.....	1	.....	1	1
10	Decatur Lead & Zinc Co.	Leasees	10	8,000	.....	185	1	1	.....	1	.....	2	.....	2	2
11	Decatur Lead & Zinc Co.	Leasees	14	10,000	.....	100	2	2	.....	2	.....	2	.....	1	1
12	Decatur Lead & Zinc Co.	Leasees	83	30,000	.....	100	3	3	.....	3	6	.....	.....	20	3
13	Decatur Lead & Zinc Co.	Leasees	90	40,000	.....	100	1	1	.....	1	.....	.....	.....	2	2
14	Decatur Lead & Zinc Co.	Leasees	30	7,000	.....	170	2	2	.....	2	3	.....	.....	4	4
15	Decatur Lead & Zinc Co.	Leasees	40	15,000	.....	105	2	2	.....	2	.....	.....	.....	4	4
16	Decatur Lead & Zinc Co.	Leasees	80	90,000	.....	120	2	2	.....	2	1	.....	.....	6	6
17	Decatur Lead & Zinc Co.	Leasees	13½	4,500	.....	170	2	2	.....	2	1	.....	.....	1	1
18	Decatur Lead & Zinc Co.	Leasees	727	\$311,000	60	96	31	1	.....	38	22	15	61	74	44
19	Decatur Lead & Zinc Co.	Leasees	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	Decatur Lead & Zinc Co.	Leasees	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	Totals.....	Totals.....	727	\$311,000	60	96	31	1	.....	38	22	15	61	74	44

EMPLOYEES, EQUIPMENT, TONNAGE AND VALUE—Continued.

LAWRENCE COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Employees.			No. of men prospecting.....	Zinc ores.		
			Miners.....	Other employees.....	Total.....		Tons zinc ore mined..	Tons silicate mined ..	Prices receiv'd For zinc..... For silicate.....
1	Baptist-Methodist No. 1 & No. 2.....	Baptist-Methodist No. 1 & No. 2.....	30	7	37	7	1,550	1,550	\$20 00
2	Berry Land.....	Berry Estate.....	3	2	5	9	47%	25	13 50
3	Black Land Mining Co.....	Lehnhard, Newman & Falk.....	4	1	5	2	25	15 00	15 00
4	Boston, Aurora Zinc Co. (formerly Minor & Rogers).....								
5	Chicago, Aurora Mining Co.....	B. A. Z. Co.....	60	15	75	12	3,469%	3,469%	34 75
6	Chicago, Aurora Mining Co.....	Chicago Aurora Mining Co.....	20	10	30	12	500	500	35 00
7	C. C. Mining Co.....	Henry Brumback.....	8	15	23	175	780	36 68	35 00
8	Dalbey & Moss.....	Lessees.....	40	4	44	5	2,000	2,000	23 25
9	Decatur Lead & Zinc Co.....		21	5	26	4	8	169	35 00
10	Kentucky Mining Co.....		40	48	88	175	1,443	33 00	13 50
11	Keystone.....		30	16	46	200	2,500	34 00	15 28
12	Loy Bros.....	Keystone Mining Co.....	7	3	10	200	124	40 00	40 00
13	Mount Vernon Mining Co.....	The Southworth Mining Co.....	24	9	33	200	1,040	38 73	14 00
14	Queen City Mining Land Co.....	Sub lessees.....	3	3	6	50	403%	54	34 75
15	Rinker Lead & Zinc Co.....	Rinker Lead & Zinc Co.....	12	9	21	4	26	70	30 80
16	St. Louis & Aurora Mining Co.....	M. R. Powers.....	3	3	6	4	7%	35 00	15 00
17	Schmook Land John.....	Sub lessees.....	10	4	14	73	1,104	35 00	14 00
18	Spring River Mining Co.....	Spring River Mining Co.....	24	14	38	7	40	34 00	14 00
19	Stratton & Co., Hargis & Co.....	Stratton & Co., Hargis & Co.....	3	3	6	20	30	22 00	19 00
20	Terre Haut Land & Mining Co.....	Duenweg, Mayer & Arleith.....	15	2	17	30	429	35 50	35 50
21	The Illinois Mining Co.....	The Illinois Mining Co.....	25	8	33	200	1,150	35 50	35 50
Totals.....			382	181	563	120	17,246%	8,460	\$34 89
									\$18 00

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

LAWRENCE COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present owner.	Lead ores.		Am't received for		Total amount received for output of both lead and zinc.....
			Tons lead ore mined..	Tons dry-bone.....	Prices received		
					Lead ore	Dry-bone.....	
1	Baptist-Methodist, Nog. 1 and 2.	Baptist-Methodist, Nos 1 and 2.			\$31,000		\$31,000
2	Berry Land.....	Berry Estate.			61		341
3	Black Land Mining Co.....	Leinhardt, Newman & Talk.			373		373
4	Boston-Aurora Zinc Co., formerly.	Minor & Rogers, B. A. Z. Co.	52%	\$46 00	331,866	\$2,426	334,412
5	Chicago-Aurora Mining Co.....	Chicago-Aurora Mining Co.			17,500		17,500
6	C. C. Mining Co.....	Henry Krumbach.....	22%	41 98	28,610	955	29,555
7	Dalby & Moss.....	Lessees.	67%	46 70	46,500		46,500
8	Decatur Lead and Zinc Co.....	"		48 00	1,752	3,152	4,904
9	Kantucky Mining Co.....	"	4%		51,149	204	51,353
10	Keystone Mining Co.....	Keystone Mining Co.			85,000		85,000
11	Loy Bros.....	Loy Bros.	25	52 00	4,960	1,300	6,260
12	Mount Vernon Mining Co.....	The Southworth Mining Co.	1	50 00	40,278	50	40,328
13	Queen City Mining Land Co.....	Sub lessees.	10%	45 50	5,866	494	6,360
14	Rinker Lead and Zinc Co.....	Rinker Lead and Zinc Co.	13	46 00	14,096	598	14,694
15	St. Louis and Aurora Mining Co.....	M. R. Powers.	20	45 00	1,852	908	2,758
16	Schmook Land, John.....	Sub lessees.	17%	50 00	1,246	875	2,121
17	Spring River Mining Co.....	Spring River Mining Co.			38,640		38,640
18	Campbell & Co.....	Stratton & Co., Harges & Co.	8%	50 00	3,076	424	3,500
19	Terre Haute Land and Mining Co.....	Duenwig, Mayer & Arleith.	16	48 00	8,811	798	9,579
20	The Illinois Mining Co.....	The Illinois Mining Co.	30	50 00	40,825	1,500	42,325
	Totals.....		289	\$47 30	\$13,163	\$13,642	\$767,905

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MADISON COUNTY.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Machinery in use.									
			No. of hand jig plants.	No. of concentrating plants.....	No. of hand jigs.....	No. of steam jigs.....	No. of crushers.....	No. of horse holsters..	No. of steam holsters.	No. of air compressors.	No. of steam pumps.	No. of boilers.....
			1	1	10	1	1	5	5	*	15	9
			120	3	120	3	\$600,000	3,000				
1	Mine La Motte—S. H. Leathe.....	S. H. Leathe.....										

*Electric drill.

MADISON COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Zinc ores.		No. of men prospecting....	Average wages paid.....	Employees.	Total.....	Other employees.....	Miners.....	Tons silicate mined...	Tons zinc ore mined ..
			Prices received	For silicate.....								
				For zinc.....								
											\$140	*64
1	Mine La Motte—S. H. Leathe.....	S. H. Leathe.....			20	\$1 50	370	240	130			

*Nickel and cobalt, tons.

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MADISON COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.		Am't received for		Total amount received for output of both lead and zinc	\$144,085	
			Tons lead ore mined..	Tons dry-bone.....	Prices receiv'd	Zinc product			Lead product
1	Mine LaMotté—S. H. Leathe.....	S. H. Leathe.....	2,875	.....	\$47 00	\$8,000	\$135,125	

MORGAN COUNTY.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Machinery in use.									
			No. of hand jig plants.	No. of concentrating plants.....	No. of hand jigs.....	No. of steam jigs.....	No. of crushers.....	No. of horse holsters.	No. of steam holsters.	No. of air compressors	No. of steam pumps ..	No. of boilers.....
			Average depth of shaft.....									
			No. of shafts in operation ..									
			Capital invested in land and plant.....									
			Acres of land leased or owned									
1	Little Lou Mining Co.....	Jacob Craycraft.....	40	\$500	32	1	1	1	1	1	1	1
2	Richland Mining Co.....	Richland Mining Co.....	400	2,500	95	1	1	1	1	1	1	1
3	Richland Mining Co.....	Geo. G. Weaver.....	40	2,000	14	1	1	1	1	1	1	1
4	Tolle Mines.....	S. A. Tolle.....	80									
	Totals.....		560	\$5,000	52	2	2	2	2	2	2	2

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MORGAN COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Employees.			No. of men prospecting.....	Zinc ores.		
			Miners.....	Other employees.....	Total		Tons zinc ore mined..	Tons silicate mined...	Prices received For zinc..... For silicate.....
1	Little Lou Mining Co.....	Jacob Craycraft.....	3	3	6	2			
2	Richland Mining Co.....	Richland Mining Co.....	3	6	9				
3	Richland Mining Co.....	Geo. C. Weaver.....	4	6	10				
4	Tolle Mines.....	S. A. Tolle.....	4	2	6				
	Totals.....		14	17	31	2			

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MORGAN COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.			Am't received for		Total amount received for output of both lead and zinc.....
			Tons lead ore mined.	Tons dry-bone	Prices receiv'd	Lead product.....		
1	Little Lou Mining Co.....	Jacob Craycraft.....	56%		\$44 00		\$2,500	\$2,500
2	Richland Mining Co.....	Richland Mining Co.....	40		48 25		1,930	1,930
3	Richland Mining Co.....	Geo. G. Weaver.....	45		48 00		2,160	2,160
4	Tolle Mines.....	S. A. Tolle.....	22		44 00		988	988
	Totals.....		163%		\$46 15		\$7,558	7,558

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

NEWTON COUNTY.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Acres of land leased or owned	Capital invested in land and plant	No. of shafts operated.....	Average depth of shaft.....	Machinery in use.									
							No. of boilers.....	No. of steam pumps..	No. of air compressors	No. of steam holsters.	No. of horse holsters.	No. of crushers.....	No. of steam jigs.....	No. of hand jigs.....	No. of concentrating plants.....	No. of hand jig plants
1	Columbus Mining Co.....	Columbus Mining Co.....	15	\$13,000	6	65	5	3	.....	4	4	4	2	4	6	3
2	Erickson Mines.....	Jos. Brown.....	30	5,000	4	100	39	1	.....	2	2	2	10	2	2	2
3	Granby Mining & Smelting Co.....	G. M. & Smelting Co.....	9,000	500,000	40	90	2	35	.....	22	8	13	3	30	2	26
4	Huey & Co., M. E.....	Kansas City M. & M. Co.....	44	25,000	1	130	2	.....	.....	1	1	1	1	1	1	.....
5	La Salle Mining Co.....	La Salle Mining Co.....	10	25,000	1	130	2	.....	.....	2	1	1	1	6	1	.....
6	Remo Mining Co.....	Malloy & Meese.....	120	2,000	1	75	1	.....	.....	1	8	1	1	35	1	.....
7	Roaring Springs Lead & M. Co.....	Roaring Springs L. & M. Co.....	360	20,000	13	75	19	1	.....	1	4	1	2	6	1	12
8	Ruby Mining & Smelting Co. & Ward Land	Henry Digby.....	80	15,000	1	90	1	.....	.....	17	4	1	2	3	1	.....
9	Saginaw Lead & Zinc Co.....	J. Reimiller & Co.....	783	50,000	2	70	1	2	.....	2	5	1	1	4	1	4
10	Shoal Creek Mining Co.....	Shoal Creek M. Co.....	40	1,000	4	60	1	1	.....	3	9	1	1	4	1	3
11	Spring City Mining Co.....	Spring City Mining Co.....	40	5,000	2	140	3	2	.....	61	37	19	2	4	1	1
	Totals.....	.....	10,512	\$681,000	76	86	74	51	.....	61	37	19	28	91	9	50

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

NEWTON COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Employees.		No. of men prospecting.....	Average wages paid	Zinc ores.			
			Miners.....	Other employees.....			Total.....	Tons zinc ore mined..	Tons silicate mined..	Prices receiv'd
For zinc.....	For silicate.....									
1	Columbus Mining Co.	Columbus Mining Co.	30	10	40	\$2 25	645	.....	\$30 00	.....
2	Erickson Mines.	Jos. Brown	3	3	6	2 00	65	.....	24 00	\$14 00
3	Granby Mining & Smelting Co.	G. M. & Smelting Co.	240	60	300	1 75	6,224	3,204	27 40	17 00
4	Huey & Co., M. E.	Kansas City M. & M. Co.	8	10	18	2 00	700	.....	35 00	.....
5	La Salle Mining Co.	La Salle Mining Co.	10	6	16	2 25	570	.....	31 50	16 00
6	Nemo Mining Co.	Malloy & Meese.	12	6	18	2 00	72½	.....	30 00	.....
7	Roaring Springs Lead & M. Co.	Roaring Springs L. & M. Co.	45	70	115	2 00	1,967	.....	38 05	.....
8	Ruby Mining & Smelting Co. & Ward Land.	Henry Digby.	5	10	15	2 00	1,164½	.....	41 06	.....
9	Saginaw Lead & Zinc Co.	J. Reimmler & Co.	20	12	32	2 00	.....	.....	40 00	.....
10	Shoal Creek Mining Co.	Shoal Creek M. Co.	4	10	14	2 25	174	.....	36 00	16 00
11	Spring City Mining Co.	Spring City Mining Co.	16	13	29	2 25	586	.....	.....	.....
	Totals.....		393	210	603	\$1 93	11,148½	3,227	\$31 59	\$17 00

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

NEWTON COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.			Am't received for		Total amount received for output of both lead and zinc.....	
			Tons lead ore mined..	Tons dry-bone	Prices receiv'd		Zinc product.....		Lead product.....
					Lead ore	Dry-bone.....			
1	Columbus Mining Co.....	Columbus Mining Co.....	4.....	.....	\$44 00	.....	\$25 155	
2	Erickson Mines.....	Jos. Brown.....	544½.....	67½.....	50 00	\$20 00	1 820	\$176	
3	Granby Mining & Smelting Co....	G. M. & Smelting Co.....	.....	.....	.....	.....	253 861	28 575
4	Huey & Co. M. E.....	Kansas City M. & M. Co.....	12½.....	47 50	50 00	.....	24 500	6 789
5	La Salle Mining Co.....	La Salle Mining Co.....	43½.....	21½.....	50 00	25 00	18 083	775	
6	Nemo Mining Co.....	Malloy & Meese.....	38.....	47 00	47 00	.....	75 986	1 786
7	Roaring Springs Land & Mining Co....	Roaring Springs L. & M. Co.....	.....	.....	.....	.....	6 754	6 754
8	Ruby Mining & Smelting Co. & Ward Land.....	Henry Digby.....	300.....	20.....	49 00	24 50	15 190	15 190	
9	Saginaw Lead & Zinc Co.....	J. Reilmüller & Co.....	63½.....	52 00	52 00	.....	6 960	351
10	Shoal Creek Mining Co.....	Shoal Creek M. Co.....	118.....	.....	50 00	.....	19 440	5 900
11	Spring City Mining Co.....	Spring City Mining Co.....	.....	.....	.....	.....	.....	.....
	Totals.....	.....	1,158½	109	\$49 34	\$21 81	\$405,942	\$59,522

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.
ST. FRANCOIS COUNTY.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Machinery in use.									
			No. of hand jig plants	No. of concentrating plants.....	No. of hand jigs.....	No. of steam jigs.....	No. of crushers.....	No. of horse hoisters.	No. of steam hoisters.	No. of air compressors	No. of steam pumps..	No. of boilers.....
			Average depth of shaft.....									
			No. of shafts operated.....									
			Capital invested in land and plant.....									
			Acres of land leased or owned.....									
1	Central Lead Co.....	Central Lead Co.....	1,601	\$1,000,000	350	14	4	3	2	3	2	1
2	Desloge Consolidated Lead Co.....	Desloge Consolidated Lead Co.....	2,800	1,000,000	380	9	5	2	2	2	3	1
3	Doe Run Lead Co.....	Doe Run Lead Co.....	4,000	1,500,000	300	21	19	2	3	7	41	1
4	St. Joseph Lead Co.....	St. Joseph Lead Co.....	7,000	2,500,000	325	21	12	5	9	10	110	1
	Totals.....	Totals.....	15,401	\$6,000,000	325	65	40	12	16	25	234	4

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

ST. FRANCOIS COUNTY—Continued.

Office number.....		Name of mine, mine owner or company.	Name of present operator.	Lead ores.		Am't received for		Total amount received for output of both lead and zinc
				Tons lead ore mined..	Tons dry-bone	Prices receiv'd	Zinc product	
						Lead ore		
						Dry-bone.....		
1	Central Lead Co.....	Central Lead Co.....	6,698½	\$40 00	.....	\$267,932		\$267,932
2	Desloye Consolidated Lead Co.....	Desloye Consolidated Lead Co.....	10,044½	48 75	.....	490,000		490,000
3	Doe Run Lead Co.....	Doe Run Lead Co.....	12,290	42 16	.....	518,189		518,189
4	St. Joseph Lead Co.....	St. Joseph Lead Co.....	20,024½	42 15	.....	844,033		844,033
	Totals.....		49,067½	\$43 22	.....	\$2,120,154		\$2,120,154

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

WASHINGTON COUNTY.

Office number	Name of mine, mine owner or company.	Name of present operator.	Machinery in use.									
			No. of hand jig plants	No. of concentrating plants	No. of hand jigs	No. of steam jigs	No. of crushers	No. of horse hoisters	No. of steam hoisters	No. of air compressors	No. of steam pumps	No. of boilers
			Average depth of shaft	No. of shafts operated	Capital invested in land and plant	Acres of land leased or owned						
1	Boulton, Geo. D.	Hugh McGregor	8,000	10	8,000	8,000	60	3				
2	Chadbourne & Long	Chadbourne & Long	4,000	75	\$75,000	4,000	20	1				
3	Higginbotham Lead Mines	Z. F. Higginbotham	1,500	30	50,000	1,500	35	1				
4	Long, Wm.	Sub lessees	688	4	10,000	688	30					
5	Renault Lead Co.	Renault Lead Co.	10,624	20	240,000	10,624	25					
6	Shibboleth Lead Mining Co.	Shibboleth Lead Mining Co.	1,200	20	30,000	1,200	40					
7	Sundry Farmers	Farmers and small operators		26			40					
	Totals		26,512	191	\$405,000	26,512	33	4	1	1	1	1

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

WASHINGTON COUNTY—Continued.

[illegible]

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

WASHINGTON COUNTY—Continued.

Office number.....	Name of mine, mine owner or company.	Name of present operator.	Lead ores.		Am't received for		Total amount received for output of both lead and zinc.....		
			Tons lead ore mined..	Tons dry bone	Prices receiv'd	Lead product.....			
								Lead ore.....	Zinc product.....
1	Boulton, Geo. D.....	Hugh McGregor.....	414%	.....	\$46 00	.....	\$19,060
2	Chadbourne & Long.....	Chadbourne & Long.....	172	.....	46 00	.....	7,912
3	Higginbotham Lead Mines.....	Z. F. Higginbotham.....	294%	.....	46 00	.....	13,558
4	Long, Wm.....	Sub lessees.....	71%	.....	44 00	.....	3,146
5	Renault Lead Co.....	Renault Lead Co.....	150	.....	44 00	.....	6,600
6	Shibboleth Lead Mining Co.....	Shibboleth Lead Mining Co.....	258%	.....	44 00	.....	11,386
7	Sundry Farmers.....	Farmers and small operators.....	565	.....	41 57	.....	23,491
	Totals		1,928%	.....	\$44 21	.....	\$85,153

LIST OF LEAD AND ZINC OPERATORS AND POSTOFFICE ADDRESSES.

BARRY COUNTY.

Proprietor or name of mine.	Operator.	Postoffice.
Dayton Mining Co.....	Prospecting.....	Pioneer.....
Happy Thought Mining Co.	Prospecting.....	Oassville.....
Henderson Mining Co.....	Prospecting.....	Purdy.....
Marriott & Berry.....	Marriott & Berry.....	".....
Neosho & Pioneer Mining Co.....	Prospecting.....	Pioneer.....
Pioneer Milling & Mining Co.....	Pioneer M. & M. Co.....	".....

CHRISTIAN COUNTY.

Kodak Mine.....	Prospecting	810 Olive, St. Louis...
New Era Mining Co.....	New Era M. Co.....	312 Chestnut, St. Louis
Oaks Mine.....	Wm. Oaks.....	Ozark.....

COLE COUNTY.

Blue Jack Mine.....	W. C. Doke.....	Bass.....
Conlogue Mine.....	V. M. Conlogue, Prospecting.....	".....
Farmer Mine.....	J. C. Collins, Prospecting.....	".....
Jefferson City M. R. & D. Co.....	W. W. Wagner, Prospecting.....	Jefferson City.....
Marsteller Mine.....	J. W. Marsteller, Prospecting.....	".....
Wyaconda Lead & Zinc Co.....	Wyaconda L. & Z. Co, Prospecting.	".....

CRAWFORD COUNTY.

Yellow Dog Lead Mining Co.....	Yellow Dog M. Co.....	810 Olive, St. Louis..
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DADE COUNTY.

Citizens Mining Co	Citizens' Mining Co.....	Everton.....
Uncle Tom Mining Co.....	Uncle Tom Mining Co.....	Dadeville.....

FRANKLIN COUNTY.

Bennett Mine.....	Joseph Bennett.....	Sullivan.....
Chimney Mining Co.....	Chimney Mining Co.....	St. Clair.....
Enterprise M. & R. Co.....	Enterprise M. & R. Co.....	704 Chestnut, St. Louis
Northumberland Mining Co.....	Northumberland Mining Co.....	Fullerton Bld'g St. L.
Sango Mine.....	Standifer & Pierce.....	Lone Dell.....

GREENE COUNTY.

M. B. W. Mining Co.....	Geo. Arnold.....	Springfield.....
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HOWELL COUNTY.

South Missouri M. & M. Co.....	S. Mo. M. & M. Co.....	Cureall.....
Alice Mining Co.....	Alice Mining Co.....	".....

JASPER COUNTY.

Proprietor or name of mine.	Operator.	Postoffice.
Ajax Lead and Zinc Co.	Ajax Lead and Zinc Co.	Joplin
Allen Mining Co.	Allen Mining Co.	"
*American Line Lead & Sm'ting Co.	American Line, Lead & Sm'ting Co.	Cartersville
American Zinc, Lead & Smelting Co.	American Zinc, Lead & Smelting Co.	Joplin
" " " "	" " " "	"
Aunt Patty Mining Co.	H. H. Gregg	"
Badger State Mining Co.	Badger State Mining Co.	"
Bailey-Stickney Mining Co.	Bailey-Stickney Mining Co.	Carthage
Bartlett Mining Co.	Bartlett Mining Co.	Joplin
BaSom, Fred	Fred BaSom	"
Becky Sharp Mining Co.	Becky Sharp Mining Co.	"
Beckwith-Hall Mining Co.	Beckwith-Hall Mining Co.	Carthage
Big Kate Mining Co.	Big Kate Mining Co.	Alba
Block City Mining Co.	Block City Mining Co.	Joplin
Blue Wing Mine.	S. C. Edgar	Cartersville
Bob Moore Mining Co.	Bob Moore Mining Co.	Joplin
Bolen Lead and Zinc Co.	St. Paul Mining Co.	"
Boqua Mining Co.	Boqua Mining Co.	"
Boston Duenweg Mining Co.	Boston Duenweg Mining Co.	Webb City
Boston Get There Zinc Co.	Boston Get There Zinc Co.	"
Boston & Missouri Mining Co.	Boston & Missouri Mining Co.	"
Boston-Providence Zinc Co.	Boston-Providence Zinc Co.	Duenweg
Bright Light, Bennet & Hannum	Bennet & Hannum	Carthage
Bunco Mining Co.	Bunco Mining Co.	Galena, Kansas
Center Creek Mining Co.	Center Creek Mining Co.	Webb City
Center Valley Lead and Zinc Co.	Center Valley Lead and Zinc Co.	"
Central Mining Co.	Cloverdale Zinc Co	Carthage
Chitwood Hollow Mining Co.	Lessees	Joplin
Columbia Mining Co.	C. C. Daubin	Webb City
Connecticut Mining Co.	Connecticut Mining Co.	"
Crown Point Mining Co.	Bowman & Davidson	"
Delaware Lease.	Webster Realty Co.	Joplin
Davey & Son	Davey & Son	Cartersville
East Hollow Mining Co.	East Hollow Mining Co.	Joplin
Eastern Star Mining Co.	West Virginia Mining Co.	Cartersville
Eldorado Mining Co.	Eldorado Mining Co.	Webb City
Eleventh Hour Mining Co.	J. W. Aylor	"
Empire Zinc Co., Eagle mines	Empire Zinc Co.	Joplin
" " Kohinoor mines	" " "	"
" " Gray lease	" " "	"
Emma Lead and Zinc Co.	Emma Lead and Zinc Co.	"
Eureka Mining Co.	S. J. O'Neill	Galena, Kansas
Expansion Mining Co.	W. W. Wampler	Webb City
Free Coinage Mining Co.	Free Coinage Mining Co.	"
Frye Mines, Beacon lease.	A. F. & C. O. Frye & J. R. Holmes	Joplin
Funk, Bowman & Co.	Funk, Bowman & Co.	Webb City
Gate City Mining Co.	Gate City Mining Co.	"
Granby Mining and Smelting Co., Oronogo	Granby Mining and Smelting Co.	Oronogo
Granby Mining and Smelting Co., Joplin	Granby Mining & Smelting Co.	Joplin
Ground, J. W.	J. W. Ground	Carthage
Hagardon & Rose	R. Hagardon	Zincite
Hammon & McElroy	Hammon & McElroy	Carthage
Hawkeye Mining Co.	McIndoe, Wilson & Benson	Howard
Herold, Fred	Ferd. Herold	Webb City
Holden Bros. Mining Co.	Holden Bros. Mining Co.	Joplin
Homestake Mining Co.	Homestake Mining Co.	Zincite
Homestead Zinc & Lead Co.	Homestead Zinc & Lead Co.	Cartersville
Idaho Mining Co.	Idaho Mining Co.	Joplin
Ihlseng Mining Co.	Ihlseng Mining Co.	Carthage
Indian River Rye Mining Co.	Indian River Rye Mining Co.	Webb City
Iowa Consolidated Mining Co.	Iowa Consolidated Mining Co.	Joplin
Ishpurring Mining Co.	Ishpurring Mining Co.	Chicago, Ill.
Jasper Lead & Zinc Co.	Jos. C. Stewart	Webb City
John Jackson Investment Co.	John Jackson Mining Co.	Trenton, New Jersey
Joplin Brewery Mining Co.	Eclipse Mining Co.	Joplin
Joplin Prospecting Co.	Joplin Prospecting Co.	"
Keystone Zinc Co.	Keystone Zinc Co.	"
Layne Geo. W.	Geo. W. Layne	"
Leonard Mercantile & Realty Co.	Leonard Mercantile & Realty Co.	Webb City
Lewis J. F.	J. F. Lewis	Joplin
Loue Elm Mines.	Perry & Litteral	Trenton, New Jersey
McKinley Mining Co.	McKinley Mining Co.	Webb City
Manhattan Mining Co.	Manhattan Mining Co.	"
Massachusetts Lead & Zinc Co.	"Hayseed Mine," Mass. Lead & Zinc Co.	Carthage
Missouri Lead & Zinc Co.	Missouri Lead and Zinc Co.	Joplin
Missouri Zinc Fields Co.	Missouri Zinc Fields Co.	Webb City
Mohaska Mining Co., Limited	Mohaska Mining Co.	Joplin
Moonshine Mining Co.	Playir Mining Co., I. B. W. Amsden	"

JASPER COUNTY—Continued.

Proprietor or name of mine.	Operator.	Postoffice.
Mount Ararat Mining Co.	J. W. Hill	Prosperity
Narragansett Lead and Zinc Co.	Narragansett Lead and Zinc Co.	Webb City
New Horse Shoe Mining Co.	New Horse Shoe Mining Co.	Trenton, New Jersey
North Heights	F. L. Yale	Joplin
Oakdale Mining Co.	J. C. Haydon	Jeanesville, Pa.
O. N. O.	Edward Miller	Joplin
Pearl "C" Mining Co.	Pearl "C" Mining Co.	Webb City
Perry, E. N.	E. N. Perry	Joplin
Pleasant Valley Mining Co.	Pleasant Valley Mining Co.	Carthage
Porto Rico Mining Co.	Schaeffer, Carlick & Frazier	Prosperity
Plutocrat Mining Co.	R. H. Branch	Carthage
Quartette Mining Co.	Quartette Mining Co.	Webb City
Rabbit's Foot	Schultz & McAllister	Joplin
Reagan Lease	J. A. Mitchell & Co.	Carthage
Red Plant Mining Co.	Jack Forty	Webb City
Rex Mining and Smelting Co.	McCullagh, Brownlee Mining Co.	Joplin
Roaring Springs Land and Mining Co.	Rex Mining and Smelting Co.	Joplin
Roberta Mining Co.	Roaring Springs Land and Mining Co.	"
Short Creek Mining Co.	W. B. Kane	Cartersville
South Carthage Mining Co.	Short Creek Mining Co.	Cagle
South Free Coinage Mining Co.	South Carthage Mining Co.	Carthage
South Joplin Lease Mining Co.	South Free Coinage Mining Co.	Webb City
Sphinx Mining Co.	South Joplin Lease and Mining Co.	Joplin
Spring River Mining Co.	Sphinx Mining Co.	Webb City
Stucky Mining Co.	Spring River Mining Co.	"
Taylor & Bogy Mining Co.	O. Stucky	Zincte
Texas Star Mining Co.	Taylor & Bogy	Joplin
Three Friends Zinc Mining Co.	Simpson, Summers, Elliott & Denison	"
Top Run Mining Co.	Three Friends Zinc Mining Co.	Carl Junction
Troup Mining Co.	Malone, Peel & Hinton	Joplin
Wheeler, Shelter K.	Troup Mining Co.	Webb City
Weyman, Henry; New Pearl "C." ..	John Carter	Joplin
Wilgus, A. B.	Henry Weyman	"
Willipus Wollopus	A. B. Wilgus	"
Witch Hazel Mining Co.	McMillins & McWilliams	Carthage
Wright Mining Co.	Witch Hazel Mining Co.	Joplin
Yale & O'Brien	Yale, O'Brien & Ziedler	"
	Yale & O'Brien	"

*American Line Lead and Smelting Co. Owing to a change in the owners of this property the report was delayed and we are compelled to notice it out of its proper place. There are 9 shafts operated of an average depth of 165 feet. Machinery consists of 1 concentrating plant, 8 hand jig plants, 6 steam boilers, 2 steam pumps, 5 steam hoisters, 6 horse hoisters, 1 crusher, 2 steam and 11 hand jigs. An average of 56 miners were employed at \$2.00 per day. Product amounted to 444 tons of zinc ore which averaged \$35 per ton and 375 tons of lead averaged \$46.50 per ton.

JEFFERSON COUNTY.

Valle Mining Co.	Valle Mining Co.	Valle Mines
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LAWRENCE COUNTY.

Baptist-Methodist, Nos. 1 and 2 ...	Baptist-Methodist, Nos. 1 and 2....	Aurora
Berry Land	Berry Estate	"
Black Land Mining Co.	Lehnhard, Neuman & Falk	"
Boston-Aurora Zinc Co. (formerly Minor & Rogers)	B. A. Z. Co.	"
Chicago-Aurora Mining Co.	Chicago-Aurora Mining Co.	"
C. C. O. Mining Co.	Henry Brumback	Mt. Vernon
Dalby & Moss	Lessees	Aurora
Decatur Lead & Zinc Co.	"	"
Kentucky Mining Co.	"	"
Keystone Mining Co.	Keystone Mining Co.	Pax
Loy Bros.	Loy Bros.	"
Mount Vernon Mining Co.	The Southworth Mining Co.	"
Queen City Mining & Land Co.	Sub-lessees	Aurora
Rinker Lead & Zinc Co.	Rinker Lead & Zinc Co.	"
St. Louis & Aurora Mining Co.	M. R. Powers	"
Schmook Land, John	Sub-lessees	"
Spring River Mining Co.	Spring River Mining Co.	Pax
Campbell & Co.	Stratton & Co., Hargis & Co.	Aurora
Terre Haute Land & Mining Co.	Duenweg, Mayer & Arleith	"
The Illini Mining Co.	The Illini Mining Co.	Stotts City

MADISON COUNTY.

Proprietor or name of mine.	Operator.	Postoffice.
Mine La Motte—S. H. Leathe.....	S. H. Leathe.....	Security Bldg. St. L.

MILLER COUNTY.

Capps Mine.....	H. H. Capps, Prospecting.....	Capps.....
Little Nugget Mining Co.....	Little Nugget Mining Co.....	Jefferson City.....
Pope Mines.....	W. S. Pope, Prospecting.....	".....
Ramsey Mine.....	Geo. Ramsey, Prospecting.....	".....

MORGAN COUNTY.

Little Lou Mining Co.....	Jacob Craycraft.....	Versailles.....
Richland Mining Co.....	Richland Mining Co.....	Clinton, Henry Co...
Richland Mining Co.....	Geo. G. Weaver.....	Aikensville.....
Tolle Mines.....	S. A. Tolle.....	Glinsted.....

NEWTON COUNTY.

Columbus Mining Co.....	Columbus Mining Co.....	Joplin.....
Erickson Mines.....	Jos. Brown.....	Tiptonsford.....
Granby Mining & Smelting Co.....	G. M. & Smelting Co.....	St. Louis.....
Huey & Co., M. E.....	Kansas City M. & M. Co.....	Kansas City.....
La Salle Mining Co.....	La Salle Mining Co.....	Joplin.....
Nemo Mining Co.....	Malloy & Meese.....	".....
Roaring Springs Land & M. Co.....	Roaring Springs L. & M. Co.....	".....
Ruby Mining & Smelting Co. & Ward Land.....	Henry Digby.....	".....
Saginaw Lead & Zinc Co.....	J. Reinmiller & Co.....	Saginaw.....
Shoal Creek Mining Co.....	Shoal Creek M. Co.....	Joplin.....
Spring City Mining Co.....	Spring City Mining Co.....	".....

ST. FRANCOIS COUNTY.

Central Lead Co.....	Central Lead Co.....	420 Roe Bldg. St. L..
Desloge Consolidated Lead Co.....	Desloge Consolidated Lead Co.....	Desloge.....
Doe Run Lead Co.....	Doe Run Lead Co.....	Doe Run.....
St. Joseph Lead Co.....	St. Joseph Lead Co.....	Bonne Terre.....

TANEY COUNTY.

Monte Christo.....	Johnson, Wheeler & Lemon.....	Forsyth.....
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WASHINGTON COUNTY.

Boulton, Geo. D.....	Hugh McGregor.....	Potosi.....
Chadbourne & Long.....	Chadbourne & Long.....	Old Mines.....
Higginbotham Lead Mines.....	Z. F. Higginbotham.....	Fertile.....
Long, Wm.....	Sub lessees.....	Potosi.....
Renault Lead Co.....	Renault Lead Co.....	1509 Chem'l B'g St. L.
Shibboleth Lead Mining Co.....	Shibboleth Lead Mining Co.....	Cadet.....
Sundry Farmers.....	Farmers and small operators.....	".....

WEBSTER COUNTY.

James River Mining Co.....	Wm. Anderson, Sec.-T., Prospecting.....	835 Cent'ry Bldg. St. L.
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WRIGHT COUNTY.

Dodson L. & Z. Co.	Dodson Lead & Zinc Co.....	Mansfield.....
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ERRATA.

Page 10—Coal output 1887, "prevented" should take place of "prevents."

Page 27—Strikes, second line after figures 1899, "our" instead of "on."

Page 31—Bates county strike, second line in last paragraph, substitute "mines 20 and 21."

Page 411—*Attention called to American Line Lead & Smelting Co.

